





The Milbank Memorial Fund  
QUARTERLY

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## IN THIS ISSUE

IN "Old-Age Problems in the Family," Dr. J. H. Sheldon, Director of Medicine at the Royal Hospital of Wolverhampton, England, presents the results of a survey of the state of old people living at home and their influence upon family life. He indicates that there is a need to find out more about the natural social biology of old age in the community so that plans for the care of the old-age population may have a more sound basis.

This is one of the series of papers presented at the Round Table on The Family as the Unit of Health, which was a part of the 1948 Annual Conference of the Milbank Memorial Fund.

Another paper from the Round Table on The Family as the Unit of Health, published in this issue, is "The Importance of the Family in the Prevention of Mental Illness," by Dr. Kent A. Zimmerman, Consultant for Mental Health of the California State Department of Public Health. He describes a program for the typical small health department which may become one of the important methods of getting a practical and meaningful preventive mental health service to larger numbers of people.

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One of the round tables at the 1948 Annual Conference of the Milbank Memorial Fund was devoted to the topic "Problems in the Collection and Comparability of International Statistics." Three of the eleven papers presented at that round table are presented in this issue. All will eventually be available in a volume constituting part of the proceedings of the Conference.

The first paper of this series, "Development of International Statistics," is contributed by Dr. Walter F. Willcox, Professor Emeritus of Cornell University and esteemed elder statesman

of statisticians and demographers throughout the world. It provides an illuminating sketch of the origins and early development of interest in international statistics. From this account many statisticians will realize for the first time the contribution that Prince Albert, Queen Victoria's husband, made to the promotion of interest in international statistics.

In the next paper "A Case Study of the International Collection of Demographic Statistics," Dr. Forrest E. Linder of the Statistical Office of the United Nations presents a series of maps depicting the geographic coverage of various types of demographic data. The study is based upon returns up to October 15, 1948 of questionnaires sent to about 250 countries during the spring of 1948.

In his paper "World Health Statistics," Dr. Knud Stowman, Epidemiological Consultant, World Health Organization, traces health statistics as an international enterprise through three main stages of development: "The first period, which lasted up to 1921, was characterized by private initiative. Then came the League of Nations period of a quarter of a century's duration. The third period, barely arising from our blueprints, is under the auspices of the United Nations and its specialized agencies, notably the World Health Organization."

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The ninth of a series of articles being published in the *Quarterly* under the general title "Social and Psychological Factors Affecting Fertility" appears in this issue with the subtitle: "Fertility Planning and Fertility Rates by Socio-Economic Status." The authors, Clyde V. Kiser and P. K. Whelpton, undertake to test one of the twenty-three hypotheses being considered in the Indianapolis Study: "The higher the socio-economic status, the higher the proportion of couples practicing contraception effectively, and the smaller the planned family." Specifically, the paper is concerned with (1) the relation of fecundity status to socio-economic status, (2) fertility rates by socio-economic and fecundity status, (3) the relation of fertility-planning to socio-economic rank, and (4) fertility rates by socio-economic and fertility-planning status.

## OLD-AGE PROBLEMS IN THE FAMILY

J. H. SHELDON, M.D., F.R.C.P.<sup>1</sup>

**T**HIS discussion of old-age problems in the family can be divided into two parts. In the first place, I want to give a factual description of the actual state of affairs in old people that I found in the course of a survey conducted in Wolverhampton; and in the second place, I want to put forward a few thoughts and generalizations on the importance of the family which I think arise from that survey.

Some four or five years ago when I was sitting on a committee of the Nuffield Foundation dealing with old age, I realized that although a great deal was known about the state of old people living in institutions, virtually nothing was known about the state of old people living at home, and in particular, nothing was known of what one may call their social biology. And so I thought it would be worth while to make a survey of the old people in my home town, Wolverhampton, which is a manufacturing town with a population of approximately 150,000.

We did that by taking an absolutely random sample of the old people. Officially in Great Britain you are old at sixty if you are a woman. Why, I don't know; but that is a fact—a legal fact. And you are old at sixty-five if you are a man. So I took a random sample of one in thirty of the old people above those ages. The sample was easy to get because we are rationed, and having obtained permission from the Government to inspect the registers we took every thirtieth ration card and we had then a sample which bore no relation whatever to income. Two investigations were made. In the first similar samples were studied by a team of social workers in a series of representative towns—Lutterworth, Oldham, the Rhondda, Wolverhampton, and two London boroughs. The results were studied by a Committee of the Nuffield Foundation presided over by Mr. B. Seeböhm Rowntree, C.H., and published by

<sup>1</sup> Director of Medicine, The Royal Hospital, Wolverhampton, England.

the Oxford University Press in a book entitled *OLD PEOPLE*. The second investigation was of a medical nature, and was confined to Wolverhampton, but the same sample was used. The results were published by the Oxford University Press for the Nuffield Foundation in a book entitled *THE SOCIAL MEDICINE OF OLD AGE*.

I now want to give you the facts dealing with the social life of these old people.

The first point: Of the 477 people who formed the sample, only 2 per cent were living in institutions, and 98 per cent were living at home. Clearly the problems of old age are fundamentally domestic rather than institutional problems. Statistics available in Great Britain dealing with the proportion of old people who are ostensibly living alone, show figures which vary from place to place from somewhere about 10 per cent up to as much as 20 per cent. But I had not gone very far with the survey before I realized that these figures were of limited value if one's attention was restricted to the house in which the old person was living, and much of the true mode of their existence in the community would be missed.

An account of the actual instance which drew this to my attention will illustrate the point.

Quite early in the survey I called on an old man of seventy-five, a retired carpenter, a nice old boy, living in a small workman's house. I called on him on a Saturday afternoon and sat talking with him in the kitchen, and through the kitchen you could see his garden, a small garden, very nicely kept, full of flowers. What struck my attention so much was the fact that on the table was a bowl of flowers and on the mantelpiece there were two vases of flowers, very nicely arranged. Now, that is not an occupation that a man normally does himself, and no ordinary man goes into his own garden with a pair of scissors. It is a feminine instinct. And so I thought it was a point worth investigating. It appeared the flowers were arranged by a married daughter living next door, and that he had another married daughter living further up the street. What was the family

structure? He lives alone; he is a householder. He appears in the old-age figures as an old man living alone. Yet one or other of the daughters comes in at midday and prepares his dinner. He goes every Sunday to one or other of the daughters. He goes out every night with one or other of his sons-in-law for a drink. And when he is ill, one or other of the daughters comes to him and looks after him. When either of his daughters is ill, he does all the shopping. Was he living alone? From one point of view, the architectural point of view, he was. But in actual fact it is equally clear that he was part of a human unit, a family unit, which spread over two or three houses, and bore no relation to architectural limitations. It was a unit which functioned quite loosely in times of peace but became more and more closely knit in times of stress.

I was very lucky to come across that case right at the beginning of the survey, because a series of questions were framed in order to find out if this was a frequent mode of existence for old people. I think the results were surprising. I am going to give you a series of percentages, and remember that each new percentage will include all that has gone before.

In Wolverhampton 4 per cent of the old people, 1 in 25, have children actually living next door. Ten per cent of the old people have children actually living in the same street. Twenty per cent of them have relatives living within half-a-mile, or within such a distance that a hot meal can be carried from one house to the other without needing re-heating. I use "relatives" instead of the word "children" because this group includes the small extra class of old persons who have no children but who are living close to a sister-in-law or a brother-in-law or other relative of the same generation. But they only account for about 10 per cent, 90 per cent of the relatives being children.

Twenty per cent of the old people, then, have relatives living within half-a-mile, so that approach from one house to the other is very easy. Forty per cent of the old people had daily visits from one or more of their children regardless of the distance away at which they lived. I think these figures show very

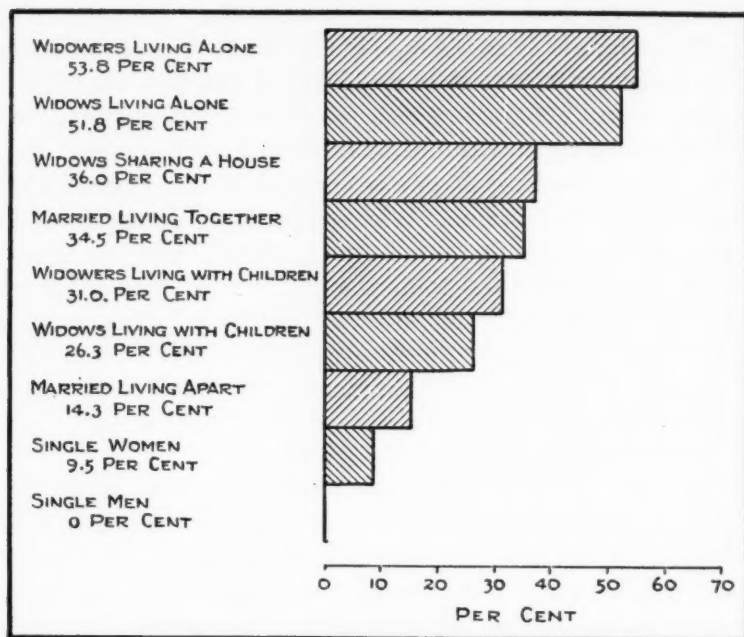


Fig. 1. Old people with relations living near. (Data from Sheldon, J. H.: *Some Aspects of Old Age*. *The Lancet*, April 24, 1948, ccliv, No. xvii. Reproduced by permission of *The Lancet*.)

clearly the fundamental part played by the family in the life of the old people. I think they show it even more when you attempt to break up those figures into the different social states, which is shown in Figure 1.

You will see that in the case of widowers who live alone and also in the case of widows living alone, over 50 per cent of them have children or relatives living close. In other words, the decision of an old man or an old woman, after the partner-in-life has died, to go on living alone in the old house is contingent upon whether or not children are living near. If children are living near, that is how they prefer to live.

Then as you go down through the other groups, the proportion decreases. Take the case of widows sharing a house—they are widows who, after their husband has died, have either set up a lodging house or have joined forces with another widow or



with an old friend and share the house; even here they are not content, but like to be near their children, for 36 per cent of them have children living close by.

When you come to old people who are married and both are still living, 34.5 per cent of those have children living close to them.

Those figures, I think, illustrate beyond any shadow of doubt the fundamental part played by the family and by the younger generation in the life of the old people.

You see it also in the very interesting group of single women. Almost 10 per cent of those have relatives living close to them. These are in nearly all cases relatives of the same generation, so that the single women, in 10 per cent of the cases, like to settle somewhere close to a relative.

The single men fascinated me because they are such a complete contrast. Not one of those had any relatives close by. They formed the most interesting psychological group. Obviously, there was something wrong with them from the start, because I presume they all could have gotten married if they wished! But they had no relatives living near whatever. They lived completely lonely lives without any trace of loneliness, and although they don't need our sympathy, they are worthy of much more psychological study.

These figures show clearly that in the life of the ordinary old person it is essential to take into consideration not merely the house in which he or she lives but also to take the whole family structure into consideration, because the family functions as one unit. It would, however, be wrong to leave it at that. Really, old people live as part of a human group in which the family is the most important but is not the whole.

Before we go on to that subject, which I am going to deal with in a minute, there is one small point of interest that came out of this question of relatives living near which I want to show you because I think it is quite important (*See Figure 2*). I was very interested when I came to work out the findings of children living in the same street to discover that when the

children were living either next door or within three houses, which meant that they would have lived next door if they could have but somebody else had got into the intervening house—of those, eight were sons but twenty were daughters. In other words, 71 per cent of those living next door to the old people were daughters. When you came to the children who were living up at the other end of the street from their parents, you found the reverse: 58 per cent of those were sons and only the smaller proportion were daughters. In other words, the daughter is very glad to settle down near her parents where she can be a constant standby for them, but the son apparently is quite willing to live in the same street so that he can be a standby in time of trouble but he is not going to be so close that there is any chance of interference with his own married life. That, I presume, is one explanation. Another explanation may very well be that some of those sons had only jumped out of the frying pan into the fire because they had gone from one end of the street to live with their in-laws at the other end of the street. That may not be the case, but it is an interesting little facet of social structure which obviously is worth inquiring about.

Now we go back to the previous point that old people form part of a human group of which the family is the most important but is not the whole.

Figure 3 deals with the care of illness in old people in their

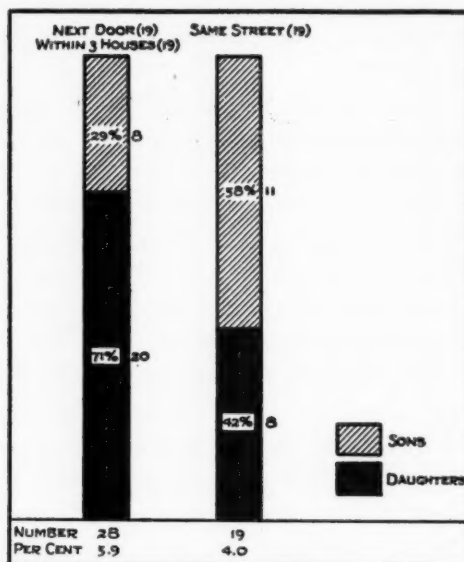


Fig. 2. Children in same street.



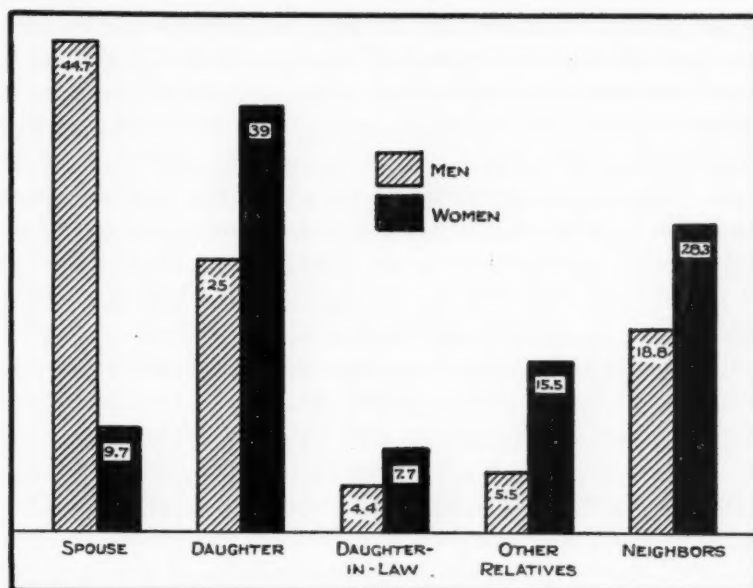


Fig. 3. Nursing of old people in illness.

own homes, where the illness was one in which the old person had to be nursed at home. Let's see who looks after the old people. You will see that when the man is ill, 44.7 per cent of the nursing is done by his wife, 25 per cent of the nursing is done for him by his daughter, only 4.4 per cent is done by daughters-in-law, and 5.5 per cent by other relatives, like sisters-in-law. That, of course, is due to the operation of social taboos and so on. But no less than 18.8 per cent of the nursing of men at home was carried out by their neighbors, and those neighbors were doing full nursing. They would be quite willing to give the old man next door a bedpan, change his bed, and things of that type. And I think that it is a remarkable thing that so big a percentage as nearly 20 of the nursing of old men should be carried on by the neighbors.

What happens to the old woman when she is ill? Husbands, I am afraid, do not occupy such a prominent place in the care of their wives as the wives do of their husbands, because only

9.7 per cent of the care of the woman is carried on by the man. But nevertheless there were in that group several instances of what I can only call sustained heroism, a thing which came as a great surprise. I shall never forget calling on an old man who was nursing a hemiplegic wife. They were the only two in the house. He was seventy-four and his wife was seventy-three. She had been ill for two years, and he had nursed her the whole of that time. He had done everything for her. During the last six months she had become incontinent. He had then given her her bedpans and changed her clothes and done everything else. He said he had got very cross with her to start with because she had often been incontinent at night when he had gone to get an evening drink; then he realized that it was not her fault, that it was his fault; and so for the last six months he had even given up his drink in the evening. And at the time I got there, he was indoors the whole day except for the odd snacks of time he had out to do the shopping. I watched him after I did the survey. That wife lasted another six months, and it was not until the last fortnight of her life, when she was beyond hope, that he thought of getting a district nurse. He said, "I married her for better or worse, and I am going to look after her and nobody else shall." That is a magnificent spirit, and that sort of thing is present in old people if you give them a chance to develop it.

Nine and seven-tenths per cent of the care of the wife is carried out by the husband; but a very large percentage—nearly 40 per cent—is carried on by the daughter; 7.7 per cent by the daughter-in-law; rather more than in the case of the man by other relatives, such as sisters and sisters-in-law; but 28 per cent is done by the neighbors.

These figures show the relative contributions made by the family and by the neighbors in the nursing of illness at home, and they establish the point that the old person lives as part of a human group, in which the family, though certainly the most important part, is not the whole.

It is not to be imagined that old people can live in such close

contact with the community as that without causing severe strains, and in the conduct of the survey I took particular notice of every case where there was strain. I graded the strains into three groups: an easy strain, which wasn't really very much; a moderate strain; and a severe strain. By severe strain I mean the sort of strain which turns the life of the person who is bearing it into that of a mere drudge. No less than 7.7 per cent of the old people were causing strains of that degree of severity on the younger generation.

What does it mean to the younger generation to bear that strain? In the first place, the strain is borne nearly always by daughters. The precise figures are these: 76 per cent of the younger generation carrying severe strain were daughters; 16 per cent were daughters-in-law; 5 per cent, to my great surprise, were nieces—nieces who were looking after old aunts; and 3 per cent were friends. So that the strain on the younger generation in looking after the old people is borne mainly by the daughters, and the effect on the daughters shows itself in two main ways: they can't get out except to do shopping and things of that kind, and 50 per cent of those daughters had restricted movement, and they can't get away for a holiday.

I well remember such instances as these: one daughter had only been to the pictures eight times in fifteen years because she could not leave the house where her old mother was. Another one had had no holiday for twenty years; she had been a slave and a drudge in that house, doing the washing and everything for an old father for twenty years without a break.

The actual distribution of the strain (shown in Figure 4) in age is very interesting. After sixty-five, the proportion of old people causing severe strain of the type that I have mentioned slowly increases until seventy-five, when it steepens; after eighty, it steepens more, and at eighty-five is rapidly steepening. And I have no doubt that if you could have figures for the centenarians, it would be 100 per cent, because I cannot imagine a centenarian who is not a burden to somebody.

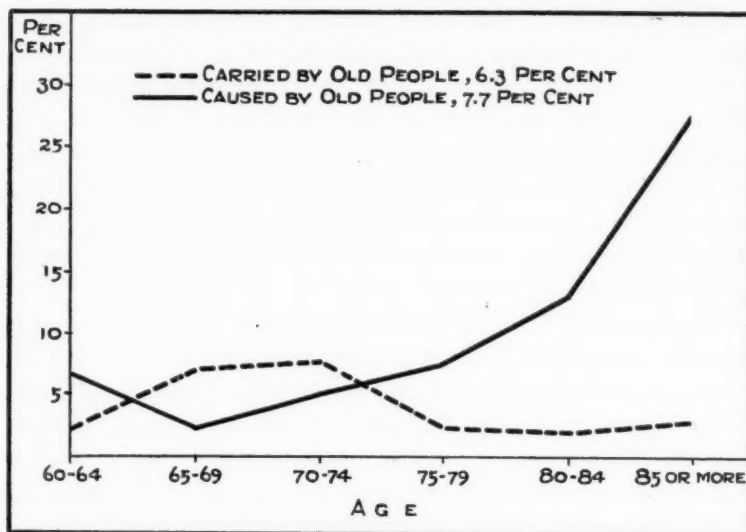


Fig. 4. Strains carried by and caused by old people. (Data from Sheldon, J. H.: Some Aspects of Old Age. *The Lancet*, April 24, 1948, ccliv, No. xvii. Reproduced by permission of *The Lancet*.)

But it would be unfair to leave it at that; to think only of the strains that are caused by old people. It is essential to remember that they carry, themselves, on behalf of the community, equal strains. Six and three-tenths per cent of the old people were carrying strains of the same degree of severity, but they can only carry them up to the age of about seventy, and then age begins to tell and the proportion decreases.

What sort of strains do the old people themselves carry? Well, they are really of three types. There is the strain of the old person who looks after a defective child, the old woman of eighty who has got a mentally defective son of fifty and still surrounds him with care and affection. There is the case of the old woman who is forced to bring up her grandchildren. I remember one woman of seventy-five bringing up four grandchildren, which was obviously a frightful strain for her. But far beyond any of those is the strain where one partner in life has the nursing of the final illness of the other partner; and that usually, of course, falls on the woman who is nursing a dying

husband. He may take some years to die, and she carries the whole strain.

So that those two curves, I think, illustrate from a different point of view the same sort of points I was making at the beginning: that old people form an integral part of the community; they must not be looked upon as living isolated lives; they cause strain, but they also carry it.

Those were the essential facts that I found in Wolverhampton of the social structure of old people.

Can we learn anything from those? Well, I should like in the few minutes that remain to me to put forward a series of propositions which may help to focus discussion.

In the first place, it is self-evident that old people form part of a family. To look on them as leading purely isolated lives is to miss the whole point of their existence. In the second place, I would postulate that there is a human tendency—I don't really think it is an instinct, it is rather a sense of responsibility, but "instinct" is perhaps an easier word to use—I think there is a human instinct which makes younger people feel that they have got to care for the older people. And the third point I would make is this: that if there be such an instinct, it is our duty as doctors to subject that instinct to the fullest possible study; and when we know more about it, we have got to give it the maximum possible encouragement in our measures for dealing with old age.

Why is that?

Well, as I walked into this building this morning, I was very interested to see the Latin inscription on the wall, and I should like to give you another one which is always in my mind, those famous lines from Lucretius: "*Naturam furca expellas, tamen usque recurret.*" Those words when uttered were merely a bright but a deep thought; now at this moment in 1948 they are a sober reality; but in twenty to thirty years' time they are going to provide us with a terrifying spectre. What do they mean? You cast out Nature with a pitchfork, but it doesn't matter, she is going to come back on you in some other way.

And you see, we in our profession are casting out Nature with a pitchfork. We are controlling more and more all the natural checks which in the past Nature has imposed on the density of her population. And if that process goes on and nothing is done about it, two major disasters are going to face our civilization. One is the pressure of population on a limited food supply; and the other, which is equally serious, is the internal pressure in our own civilization of the burden of the aged and of the younger people who are infirm. If conditions continue, the burden imposed by those is going to be such that it will be more than our civilization can bear.

And so I think that it is essential in dealing with old age to get away from the purely caretaker attitude, the aspect of providing an increasing number of homes for them. We have got to find out more about the natural social biology of old age in the community, and then encourage its help along those lines.

Two more points: (1) Why do I say that if there be such an instinct, it deserves study?

I can't overemphasize the importance of that. Obviously, it is not an instinct in the sense that the maternal instinct is one, an overpowering state of mind, because it shows such extreme variability. Look at its anthropological aspects. From what one reads of China, at any rate in the old days, ancestors were worshipped, and old people were looked upon with the very deepest respect. But there were some South Sea Islanders who ate their old people. The Eskimos, so I have read, put the old people, when they can no longer support themselves, out in the Arctic night. Even more interesting, look at British Guiana—which contains the second or third biggest waterfall in the world—it is called Kaieteur, and "Kaieteur" I am given to understand, is the Indian name for an old man; and it is called that because it was the habit of the Indians, when their old men could no longer support themselves, to put them in a canoe without paddles and send them adrift to die. This sense of responsibility for the care of the aged appears to range from zero in some human races up to the maximum possible in others,



such as the Chinese. I would say that the difference is probably based on economic factors. A civilization that is agrarian, such as China, can apparently support its old people and manage to get away with it; a civilization whose economy is that of hunting obviously cannot, and the old people have to be slaughtered.

(2) Where do we stand? We are neither. We are an urban civilization, and I think we just don't know yet the extent to which that instinct is strong in different places, because I am quite sure that it does vary from place to place.

So I think that instinct varies, in the first place, with the type of economy; in the second I think it varies from place to place very largely because of architectural differences. The slide I am showing you now is a picture of Wolverhampton taken from the Hospital roof, and I am showing it to you because it illustrates one type of housing that we have. There you don't have the type of housing that I see so much of here, where each house is standing in its own garden, but there are rows upon rows of streets of workers' houses, all of which are contiguous. Each house has a front door which is never used except on state occasions, and there is a common entry every five or six houses which takes you round to the back of the houses. The people therefore go in and out of their back doors, passing by the back doors belonging to the other houses. That is the type of architectural structure that is common in a British manufacturing town. I have shown you this picture of part of Wolverhampton because there you see the conditions under which the family instinct can thrive. People are living next door to each other; they have got common back entries; it is rather like a rabbit warren, and the people are living all the time, in a sense, as part of a communal structure.

My friends say that may be true of Wolverhampton but it is not true of London; in London the younger people have not got the same affection for their old ones. If this is true, I think the reason is architectural. I think the Londoners are born with the same amount of affection, but the old people tend to

live more in tenements, single rooms, and it is very much more difficult under those circumstances for that instinct to flourish.

There are therefore many variable factors of that kind, that need to be taken into account; but I do feel that it needs the fullest possible study. This instinct, if it be such, is a tender plant, and we have got to find out what are the economic conditions, what are the social conditions, what are the architectural conditions and so on, in which that instinct has the maximum chance of development. And when we know that, then I think it is essential for us in the future to adjust all our schemes for the care of old age along those lines. Instead of going on buying more and more homes for caring for old people, we have got to do our best to encourage the family to look after them, and to do nothing which makes it unnecessary for the family to look after them, because that is the best thing for the health of the old people themselves. Then they are still in the family, they can still contribute to our civilization; and at the same time the younger people, by looking after them, can save us from the burden.

That is all I have to say. I can only sum it up by stating that I think in the future, with the increasing number of old people, if we merely take the line of least imagination and least resistance, which is that of just simply having a caretaker policy, building up homes for them, we shall end in disaster. But the experiences in Wolverhampton do show that the family, under suitable conditions, has a sense of responsibility toward their old ones, and that the old people can themselves contribute to the welfare of the family. And knowing that, it is our duty, I think, to make all the inquiry and study we can of that aspect of old age and model our plans for the future on it.



## THE IMPORTANCE OF THE FAMILY IN THE PREVENTION OF MENTAL ILLNESS

KENT A. ZIMMERMAN, M.D.<sup>1</sup>

**I**N the discussion of this subject I feel I need to first develop briefly why it seems to many persons that the family as a unit may become the most important dynamic entity with which to deal and plan in relation to the prevention of mental illness. In order to think in this way it seems appropriate to consider the soundness of the idea that the family is the medium wherein is produced the basis of the personality structure, and given its potentialities of growth.

Historically this type of thinking about the family is relatively recent, and it comes to us from two sources: (1) the study of the individual within the family which got its impetus primarily from the psychoanalytical study of the individual, and which viewpoint was expounded in the now classic study in this field, that of Flügel (1), published in the 1920's. (2) About this same time sociologists and anthropologists, as represented by Margaret Mead and Ernest Burgess, made the second contribution to the concept of dynamics and its relationship to personality in the family growth when they introduced the idea of the family as a unit of interacting personalities (2) rather than as a unit influenced and molded merely by such external factors as economic change, migration, and social custom.

The combination of these two approaches, the analytical and anthropological, is now giving promise of continued major contributions in the study of personality as represented by the work of Abram Kardiner (3).

As a result of these studies, a practical working concept of the family useful for the sciences of psychiatry, sociology, anthropology then became the following: The family is a unit of interacting personalities, each with a history and function in

<sup>1</sup> Consultant for Mental Health of the State of California Department of Public Health.

a cultural milieu (4, 5). Psychiatry and psychoanalysis have contributed and continue to contribute with their findings to the first aspect of this definition. Sociology and anthropology have given us and will continue to give us contributions relative to the second aspect of this definition, the cultural milieu.

Biology has also exhibited much interest in the family from the heredity standpoint in that it sees the family as a transmitter of certain genic traits and their perpetuation (6). The reflection of this interest exists, of course, today in the persistent discussion in regard to eugenics and so-called selective breeding. To round out our definition, a restatement of the working concept of the family and its relation to personality development then becomes, as Meyer Nimkoff, for research purposes has so well put it (7), "The family is a mediator of genic factors on the one hand and cultural factors on the other, in the formation of the basic personality structure."

I have emphasized that each of these sciences will continue to give us contributions because I wish to emphasize that these concepts are dynamic in character. It is because they are dynamic, not static, that they are usable as a working definition in the field, adaptable to the infinite variety of personalities encountered, and capable of projective thinking into the future, which are the two necessities for "preventive" thinking and planning as to personality development.

## SECTION II

### THE INDIVIDUAL INTERREACTIONS WITHIN THE FAMILY

As a unit the family is conceived of in our culture as parents and one or more children. To the formation of the family each parent brings his own background and lifetime emotional experience which go to form the image each has of himself or herself in the role of husband or wife. These concepts are rarely expressed verbally by either of the parents, but each becomes aware of the other's concept of himself as a connubial figure over a period of time through the acting out by each parent of these roles. This process is often barely begun before children enter

the picture which again calls for the further reorientation on the part of each parent of themselves in relation to each other by way of the personality of the child.

In the growth of the children in the family, each parent, both consciously and unconsciously makes a contribution to the personality structure of their children, but at the same time the parents have reawakened in them certain problems related to their own growth and development. The dynamic force of these problems seems dependent upon the extent to which they themselves were able or unable to satisfactorily resolve them in their own growth. Also, many families have as part of their make-up one or more grandparents living intimately with them. This situation often complicates the process of parental maturity, since the presence of the grandparents reawakens or emphasizes certain disturbing child-parent problems, and this in turn causes reverberation upon the grandchildren and their developing personalities.

Psychiatry has elucidated for us to some extent that one of the main problems each individual has is the working through of his emotional dependency-independency relationship with his parents. This is made more or less difficult for each child depending upon the balance of each parent's dependency and independency needs and further complicated by the influence of such factors as sex of the child, position in the family, parental attitudes at the time of conception, chronic illness and other environmental factors or hereditary traits.

The major schools of dynamic psychological thought, the psychoanalytical and the gestalt schools, have postulated concepts of growth and development which in the main consist of factors primarily within the individual. For example, Freudian psychology conceives of the workings of the personality as resulting from the interaction of three components designated as id, superego, and ego, and that there is a common pattern of growth which can be separated into levels of experience characterized by certain predictable interactions of the id, superego, and ego. These have labeled oral, anal, and genital

periods—having for their orientation bodily areas of mucocutaneous junctions which are seemingly predominant in tension or sensation at certain periods of growth. Offshoots of the classic Freudian theory have emphasized other dynamic factors—such as the organ inferiority of Adler—or the libido and collective unconscious of Jung. In this latter concept, Jung was the first to emphasize the importance of the “race” or “archaic experience of mankind” as of primary importance in the internal dynamics of personality growth. This approach has been further modified by recent psychiatric thought which gives much weight to cultural factors in the understanding of personality formation and adaption. The psychobiological concepts of Adolph Meyer show this, and psychoanalysts are healthily beginning to question their own classic concepts. For example, Erickson recently elaborated upon a factor which he has named “group identity,” and which he believes is as important as ego identity in the dynamics of personality growth (8).

### SECTION III

#### THE CULTURAL CONSIDERATIONS

Certainly one consistent characteristic of the American family which even the most casual observer would grant is its diversity. This is not unexpected since our nation is composed of various cultural groups nationally, racially, and regionally. Another reason for the diversity is that all families seem to be in transition, or cultural change, toward a more or less common pattern as suggested by certain sociologists, yet out of all this diversity there still can be found certain characteristics which give us more or less generalized standards and a sense of orientation in the observation of families (9). Because the sociologists have identified these characteristics, we can have a sense of comparison of the stage of movement of one family toward the common pattern, and can therefore begin to perceive what the problems of a family are still going to be. This allows us to make possible predictions relative to the problems a family has to face in its growth as a unit. This, combined with some knowl-

edge of the individual personalities within the family, can give us impressions which will allow us to make scientific guesses as to the capacities of the individual and the family to meet the problems. Once we can do this, we have a tool which will enable us to think preventively.

Burgess has identified certain chief traits which apply to the American family:

1. Modifiability or adaptability
2. Urbanization
3. Secularization
4. Instability
5. Specialization
6. A trend to companionship

For purpose of our discussion I wish to amplify the concepts of companionship and adaptability. As to the companionship type of family the sociologists mean a family in which the cohesive unity in a family is found in the interpersonal relationships of its members as contrasted with the families which are labeled as institutional where families are held together predominantly by such forces as law, public opinion, custom, and duty. This does not mean that companionship between family members, affection, and happiness is necessarily absent in institutional families but rather it is that such is not the primary reason for formation of a family. Rather more important for institutional families are having children, social status, fulfillment of family social and economic functions in society (10).

The concept of adaptability of a family resides in the functioning personalities of the individual members. It seems to depend upon three factors: (1) psychological, or the degree of flexibility in emotional reaction to change or confronting a new situation; (2) the cultural or educational factor influencing the person to act in an appropriate way; and (3) the possession of knowledge and skills which aids in the making of an adjustment. Sociological research seems to show that the growing adaptability of the companionship type of marriage seems to

make for the greater stability for the family in the long run. In other words, family stability arises from the strength of the interpersonal relationships of its members, that is, affection, rapport, common interests and objectives, not the force of public opinion, customs, law, etc.

Another sociological contribution we have found of much importance in understanding family problems is the use of classification of families according to the locus of authority within the family. These are listed as:

1. Patriarchal (Amish of Pennsylvania)
2. Kinship control (certain Southern families, and Ozark mountaineers)
3. Semipatriarchal (Italian immigrant)
4. Emancipated (rooming house)
5. Patricentric (lower middle class)
6. Matricentric (suburban)
7. Equalitarian (apartment house)

Since internal migration of families is so prevalent in this country, the forces put into play when a family by reason of migration changes from one pattern of living to another, with consequent reorganization of its members to the locus of authority, will inevitably result in some increase in problems for the parents and their children in regard to each other's role and their emotional attitude to each other.

#### SECTION IV

##### THE APPLICATION OF THE ABOVE PRINCIPLES IN PRACTICE

Since the family in its growth toward stability depends on interaction of personalities, we will expect: (1) personality clashes will from time to time exist between members of a family; (2) the children will be involved, since they are part of the family unit, with resulting influences on their own growth and development.

In order to gauge the family's behavior and the trend toward healthy stability of the family, we need to ask ourselves



wherein do workers who deal with families get the opportunity of learning about these family problems, and the family members' capacities to cope with them. Normally the opportunity comes when the family is confronted with new situations which increase the anxieties of its members and call for readjustments to each other. Such opportunities, for example, would be during the time of pregnancy of the mother where one gets a chance to learn of what her concept of the mother role is, her attitude toward the children, her pregnancy, and her husband. The well-baby clinics and doctors' offices wherein the problems of feeding, toilet training, and identification of children with parents give us inside attitudes of the parents about each other and their children and their attitude to the social group. Illness in the family of one or more members allows us to judge how well the family fares in its adaptability to crises and whether the dependency-independency relationship of the individual members is being handled satisfactorily.

There are other situations which force families to seek outside help such as economic crises, deaths, and the adjustments to war which gives the social workers, school teachers, ministers, physicians, nurses, and others an inkling of what the problems are in interpersonal relationships. To scientifically and skillfully help a family, a worker should listen and provide himself with a knowledge of the following: (1) Tentative evaluation of the personalities involved; and (2) a picture of the trend of the family in its adaptability pattern. We have found however, that most secure and competent family workers will spontaneously admit they are lacking in training and preparation for acquiring this basic information. At the same time, by studying their field functioning, we have also discovered what is needed by workers who attempt to help families with their problems (11). They need: (1) Knowledge and skill of what constitutes good interviewing and counseling, including a knowledge of the therapeutic relationship, appropriate to the professional functions of the workers; (2) a working knowledge of the growth and development of the individual; and (3) a

working knowledge of the cultural and social family problems in their communities.

## SECTION V

### ATTEMPT AT APPLICATION IN THE FIELD

As part of the exploration of the developing of a mental health program in health departments, we have been studying how to find ways in which to teach nurses on the job what they might do in working with their patients as part of their families in their adjustment. With the cooperation of the staff of a local health department, we have established what we call a family consultation clinic. This clinic meets once a week to which certain of the nurses refer a family which interests them and has given them problems in guidance, usually because of personal attitudes they are confronted with on the job. One or more members of such a family come to the clinic to have an hour's conversation with myself and the nurses about their problems. These are families which have been seen previously by the nurses in well-baby, tuberculosis, venereal disease clinics, or other services.

As part of the evaluation of a situation we must know the cultural background of the family, that is, of each parent, for example, whether the father came from an Italian semipatriarchal family or the mother came from a suburban matricentric family, the evaluation of the person as to his flexibility, and the nature of the personality defenses being used in the adjustment by himself as a person. A history of how the family met previous crises and what happened becomes important in judging the trends toward adaptation or defeat.

Next we draw our attention toward the children in the family, especially as to their growth needs. We are especially interested in: (1) attitudes of parents toward the child (a) at time of conception, and (b) in early infancy—feeding and toilet training; (2) the period of identification at the age of four or five in which the girl identifies with the mother in the family role, and the boy with the father's. We are concerned



especially when we find either one of the parents absent at this period or parents with ineffective personalities; (3) as to the school-age child we are especially interested in learning of the individual's behavior at the beginning independency period when he begins to be more critical of the parents and more accepting of group standards, and his success in establishing group relations between the ages of six and ten; (4) the early adolescent period where the growth forces again reactivates individual and family problems; and (5) the distribution and use of authority by the parents in the preschool, school, and adolescent periods we feel is of special importance for the growing individual who is to play his part in a democratic society.

We are finding that the concepts enumerated above are teachable, by means of a case discussion technique, to nurses in the field who have had relatively little or no exposure to individual casework practice as based on modern psychological and sociological ideas. Furthermore, it seems possible to do this with relative efficiency and as part of the daily work program of the typical small health department, provided there is good leadership present in the health officer and directress of nurses. We are thus encouraged that this may become one of the important methods of getting a practical and meaningful preventive mental health service to larger numbers of people.

#### REFERENCES

1. Flügel, J. C.: *PSYCHOANALYTIC STUDY OF THE FAMILY*. London, Wolff, 1926.
2. Levy, John: *THE HAPPY FAMILY*. New York, Alfred A. Knopf, 1945.
3. Kardiner, Abram: *THE PSYCHOLOGICAL FRONTIERS OF SOCIETY*. New York, Columbia University Press, 1945.
4. Nimkoff, M. F: Trends in Family Research. *American Journal of Sociology*, May, 1948, 53: No. 6, p. 477.
5. Dollard, John: Needed Viewpoints in Family Research. *Social Forces*, October, 1935, 14: p. 109.
6. Scheinfeld, Amram: *YOU AND HEREDITY*. New York, Garden City Publishing Company, 1945.
7. Nimkoff, *Ibid*, p. 481.

8. Erikson, E. H.: Ego Development and Historical Change in THE PSYCHOANALYTIC STUDY OF THE CHILD. A. Freud and Hartmann, Kris (editors) New York, The International Press, 1947, Vol. II.

9. Burgess, Ernest W.: The Family and Sociological Research. *Social Forces*, October, 1947, 26: p. 1.

10. Burgess, Ernest W.: The Family in a Changing Society. *American Journal of Sociology*, May, 1948, 53: No. 6, p. 417.

11. Zimmerman, K. A.: The Beginnings of a Mental Health Program in a State and Local Health Department. *American Journal of Public Health*, June, 1948, 38: p. 811.

## DEVELOPMENT OF INTERNATIONAL STATISTICS

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IN THE first half of the nineteenth century the North Atlantic area saw an efflorescence of statistical societies. Over thirty of them, usually *urban* in name and character, sprang up in England, Scotland, Ireland, France, several German states, the United States, and Mexico. Nearly all soon withered but the Statistical Society of London and another in this country were exceptions. The former thrived and half a century later became the Royal Statistical Society. The latter called itself the American Statistical Association but provided that its annual meetings should be held in Boston and notwithstanding its name was in fact through over half a century little more than the statistical society of Boston.

During the same half century *national* organizations of natural scientists began to form. An early and important one was the Association of German Scientists founded in 1822 by a handful of scholars in that complex of countries. After a few dark years it won royal approval from Bavaria and Prussia and, more important, received the allegiance of scientists the world over after it had elected Humboldt as president. He was the recognized head of the naturalists of the world, as distinguished in his field as Napoleon or Goethe were in theirs.

Babbage, the main founder of the Statistical Society of London which soon became the cradle of international statistics, attended the coming out session of the German society at which Humboldt presided and three years later played an important part in launching the British Association for the Advancement of Science, founded in frank imitation of its German prototype. The main object of these societies and their successors, whether in the field of the natural or of the social sciences, was and is to promote friendly intercourse, national and international, among scholars with common interests.

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The British Association organized in 1831 found at its third meeting that the five divisions of science which it recognized did not cover the whole field and a sixth section called statistics was added, though without full authorization of the governing body. Babbage, the moving spirit in the expansion of its field, speaking at the request of the president of the Association, explained that a statistical section had been formed largely to receive important papers brought to it by a distinguished delegate of a foreign country. That delegate was Quetelet of Belgium who had come to England mainly to attend the meeting of the Association and who contributed materially to the formation of its statistical section. He was already so renowned as a mathematician and astronomer that he could not be looked down upon by the members of the British Association even though he had recently stooped to statistics. Among the statistical section's other sponsors were Malthus and Richard Jones, newly appointed professor of economics at Kings College, London. However, the supercilious attitude of many devotees of natural science toward the intruder led Quetelet to suggest and his English friends to put through a plan for creating in London an independent Statistical Society.

Quetelet has been hailed as the founder of international statistics;<sup>2</sup> that statement seems to me only a part of the truth. To be sure he had recently elaborated the scientific basis of statistics in the theory of probabilities, had helped with the Belgian census of 1830 and was the most widely known and influential statist in Europe. But in founding international statistics he was greatly aided, as we shall see, by his pupil and friend, Prince Albert of Saxe-Coburg-Gotha, cousin and later husband of Queen Victoria. As the importance of Albert's cooperation has not received adequate attention, you will allow me to explain why I attach such importance to it.

Victoria had lost her father in her infancy and her education was guided by her uncle Leopold, afterwards king of Belgium.

<sup>2</sup> Flicker, A.: die statistique internationale wird stets Quetelet's grossartigste Schöpfung bleiben, *Statistische Monatschrift* 1, p. 13, 1875.

She and her cousin, Albert, met for the first time at the age of 16 during Albert's visit of several weeks to his English relatives; on that occasion a marriage between the cousins, long hoped for by the families, was suggested to Victoria. She was interested but obviously too young for a decision. However, Albert's education thereafter was shaped with the probability of that marriage in mind. He was sent first to Brussels, where he could study from the inside the working of a constitutional monarchy after the English type administered by his uncle. At this stage Leopold's secretary, Stockmar, exercised such influence that the saying, "Stockmar created Albert and Albert created Victoria," has truth enough to justify its mention. Before Albert went on to the university Leopold or Stockmar put him for some months under Quetelet. The relationship which started as one between a bright boy of seventeen and a great teacher of forty grew into a friendship which lasted until Albert's untimely death twenty-five years later. Shortly before he died Albert, as president of the fourth session of the International Statistical Congress, hailed Quetelet as the man who had introduced him to higher mathematics and elucidated their application to social phenomena, a field in which laws might be discovered only by accumulating and interpreting statistics.

A preliminary step toward founding international statistics was taken by Albert, when he organized the London International Exhibition of 1851, first of a long series. The burden of starting it and of persuading public opinion in all parts of the world to favor and participate in it fell on him. National exhibitions of limited range had been held in England before 1851 by a society of which Albert became president. When he proposed that the society should enlarge the scope of its Exhibition by making it international the idea encountered much opposition but Albert's tact, energy, and enthusiasm surmounted all obstacles and carried it to a success unforeseen and triumphant.<sup>3</sup>

<sup>3</sup> "In 1849, he began a train of thought which was to bring him his greatest success in England: the Exhibition of 1851" Bolitho, Hector, *REIGN OF QUEEN VICTORIA*, 1948, page 112.

Some of Albert's followers in England and Quetelet in Belgium had dreamed that the Exhibition would bring together not only men of affairs but also scholars into scientific conference and thus facilitate international intercourse at another level. Before it was held Quetelet had written to Albert: "Assuredly I shall go to Engand. . . . These are the tournaments of modern times. Your Royal Highness has appreciated the social transformation now in progress and in placing yourself at the head of this great movement you give a fresh proof of your sagacity."<sup>4</sup> On his return to Brussels Quetelet and another member of the Belgian Statistical Commission proposed to their English friends that an International Statistical Congress should be organized to work for greater comparability in statistical publications.

The plan was approved, the Congress met in Brussels in 1853 and achieved a notable success; twenty-six countries were represented and many of the leading statisticians of the world attended. In an Introduction to the Report Quetelet expressed the hope that future work of the sort in all countries would take account of the recommendations of the Congress and would adopt uniform bases for their statistics so that the results reached in different areas would be comparable. The possibility of such a result, he said, had been shown, its framework settled, and the wisdom and harmony revealed in the final report were an augury of success.

The Brussels meeting expanded into a series of nine sessions held between 1853 and 1876 in as many different European countries. But at later meetings the technical experts were almost swamped by the increasing body of amateurs or interested listeners. To remedy this defect Quetelet proposed to the fourth session that the official delegates and experts should meet by themselves just before or after the main session. The seed fell on good ground. The proposal after being debated at subsequent sessions ripened into a comprehensive plan for a cooperative work on international statistics, the *Statistique*

<sup>4</sup> Martin, Theodore; *LIFE OF THE PRINCE CONSORT*, Vol. 2. p. 244.



Internationale, the guidance of which was to be placed in the hands of a Permanent Commission of the Congress. This Commission created in 1872 met four times in the next six years. Its final meeting was devoted mainly to an effort to perfect its own organization and to define and enlarge its field. It proposed to publish in Paris an international statistical annual and a statistical bulletin both in French, as the accepted language for international intercourse.

Regarding these proposals the German representatives, probably acting on a hint from Bismarck, declined to commit themselves, and when another meeting of the Commission was at hand several countries were unwilling to accept the invitation to attend that meeting or the Congress itself planned for the following year. So the Hungarian president of the Commission wrote to the other members:<sup>5</sup> "All the German states have refused to be represented on the Permanent Commission; Switzerland has followed this example; representatives of Spain and of Sweden have sent excuses; Portugal and Holland have not answered; regarding England and Russia I am not even yet in a position to know whether they will be officially represented or not. Under these circumstances. . . . I have at last decided to postpone the session." And thus both the Congress and its Permanent Commission came to an end.

The preceding narrative shows that German opposition to tendencies in the Statistical Congress and especially in the Permanent Commission was mainly responsible for their death. But the underlying cause of their collapse lay deeper; it lay in the difficulty of reconciling two different conceptions of the function and field of the Congress. This difficulty had been clearly stated by Albert fifteen years before in the address already mentioned. He then said:

It would have been more properly within the province of a member of the Government, and Minister of the Crown, to fill this Chair and open the proceedings, as in previous meetings.

<sup>5</sup> Allgemeine Zeitung, June 14, 1885, as quoted in Royal Statistical Society Jubilee Volume p. 343.

[But] the nature of the institutions and the habits of the people of this country could not fail to influence its organization. We are a people among whom every question of interest to the nation is publicly canvassed and debated; the whole nation takes an active part in these debates, and arrives at a judgment with regard to them. This congress could only be, either a private meeting of the delegates of different Governments discussing special questions of interest, or it had to assume a public and a national character; the Government have chosen the latter alternative. They have wisely chosen; for it is of the utmost importance to the object the Congress has in view—namely, not only the diffusion of statistical information, but also the acquisition of a general acknowledgment of the usefulness and importance of this branch of human knowledge—that the public, as a whole, should take up the questions which are intended to be investigated, and should lend its powerful aid.<sup>6</sup>

At later sessions the Congress sought to work toward both of the objects mentioned by Albert through detaching the Permanent Commission, as “a private meeting of the delegates of different Governments discussing special questions,” from the Congress proper but the attempt failed and Congress and Commission died. Then an effort was made in France to continue international collaboration in demography, as a part of the broad field of statistics. The editor of the *Annales de Démographie Internationale* proposed holding an International Congress of Demography in connection with the Paris Exposition of 1878 and near in time to what proved to be the final session of the Permanent Commission. Although it was held and was well attended, demography alone, it appeared, furnished an inadequate basis for a series of international conferences. Because of that fact demographers soon affiliated with a parallel series of International Congresses of Hygiene to form the International Congresses of Hygiene and Demography which met at irregular intervals between 1878 and 1912. What proved to

<sup>6</sup> Collection of British Authors, Tauchnitz edition, Volume 850, *SPEECHES AND ADDRESSES OF THE PRINCE CONSORT*, Leipzig, 1866, page 229 f.

Another reference for the quotation is *Quarterly Journal of the Statistical Society*, Vol. 23, 1860, page 277 f.



be the last meeting of this series was held at Washington. It adjourned in the expectation that the next session would be in Russia five years later but in 1917 that country had no energy to spend on international statistics. So this series died during the first World War as the International Statistical Congress had died after the Franco-Prussian War.

The death of the latter and of its Permanent Commission left in the minds of many European statisticians, however, a sense of loss and, I am sure, an irritation over the way in which they had been treated. So six years later, when the jubilee meeting of the Statistical Society of London was at hand and the twenty-fifth anniversary of the Statistical Society of Paris was only a year away, the time seemed propitious for a new start which should profit from the mistakes of the earlier Congress. The death of Queen Victoria's son in 1884, by postponing the jubilee meeting of the London Society, brought the two anniversary celebrations within a few days of each other and resulted in their becoming almost one session in two capitals and their being attended by much the same group of statisticians from Austria, Hungary, France, Italy, England, Norway, and the United States; none came, however, from any German state. The Statistical Society of London had enlisted in advance the aid of Neumann-Spallart of Vienna, who brought with him to London not only a résumé of the results of the Statistical Congress but also a draft of statutes for a prospective International Statistical Institute which he had prepared with the help of Bodio of Italy. After the draft had been discussed it was referred to a committee composed of statisticians from England (Mouat, Martin) Austria (Inama-Sternegg, Neumann-Spallart) Italy (Bodio) France (Levasseur) United States (Walker) Russia (Troinitsky) Norway (Kaier) Hungary (Keleti) and Greece (Argyropoulos). The committee recommended only minor amendments, the most important being the omission of everything tending to give an official character to the new Institute. The new draft was adopted with a proviso that its wording be revised and settled at the Institute's first regular meeting.

At the London session twenty-two persons present from eight countries were elected and fifty-one more from eight other countries invited to join. Among the fifty-one were the director of the German Imperial Statistical Department (Becker) and the director of the Royal Prussian Statistical Bureau, (Blenck). They replied jointly to the invitation asking for more information about a seeming conflict between their position as official statisticians and their possible position as members of the new Institute.

The kernel of the reply from the president, Sir Rawson Rawson, lies in the following sentence: "While the direct object of the Congress and Permanent Commission was to influence Governments, that of the International Statistical Institute is to acquire and perfect statistical knowledge and to furnish information to those Governments."<sup>7</sup> The reply was satisfactory and, before the first regular session of the Institute opened at Rome two years later, they and about a dozen other Germans had joined.

But the aloof attitude of the Imperial German Government continued. Sixteen years had passed and the Institute had held seven sessions in various European capitals before Germany invited the Institute to meet at Berlin. Even then, I was told, the hand of the imperial government was forced by a suggestion that, failing an invitation from it, Bavaria would invite the Institute to meet at Munich.

The practise of the Institute from the start had been, as it remains, to use French in its official communications, that being the recognized language of diplomacy. An earlier practice now discontinued was for the president of the Institute to send notes of invitation through the Foreign Office of the country which was the host to each member notifying him of the approaching session. But, when the Viennese president sent his notes prepared in French to Berlin to be sent out, word went back that, if the meeting was to be held in Germany, the in-

<sup>7</sup> Bulletin de L'Institut International de Statistique, Tome 1, 1ère et 2ème Livraison, page 33.

itations should be in German. Finally the difference was patched over by a bilingual invitation.

Just before the first World War the Institute had set up a Permanent Office to gather and publish international statistics. It was put in charge of the Secretary General at the Hague and his ability and diplomacy, much aided I feel sure by the wisdom of President Bodio, were mainly instrumental in keeping the Institute alive and able to continue its publications through that war.

The last pre-war meeting had ended in accepting an invitation from Belgium to meet at Brussels in 1915. When the war was over the question of the relation between the prospective statistical work of the League of Nations and similar work already prosecuted by various international organizations, of which the Institute was probably the most important, was studied by a representative commission of twelve members. They could not agree on an answer to the fundamental question: Should the league set up a statistical section of its own or should it rely upon existing organizations?

Thereupon the League, because it wanted advice upon important statistical problems, moved to have the Belgian invitation revived and, when that occurred, set up several joint committees on the main problems, reports from which were ready when the Institute gathered at Brussels in 1923. At that time there were three vacancies on the Bureau or Executive Committee caused by the deaths of Bodio and Meyer and the illness and absence of von Mayr. The vacant places which had been held by an Italian, an Austrian and a German were filled by a Belgian, an Austrian and an American, this being only the second time that a non-European had been given a place on the governing board.

Among the American members present at Brussels was Hadley who had retired two years before as president of Yale. At that meeting he developed an interest in the Institute which continued until his death seven years later and did much to win increased support for it in his own country.

After the meeting in Brussels and another two years later in Rome eight meetings were held before the second war, seven of them, all but the London session of 1934, the centenary of the Royal Statistical Society, being in countries (Egypt, Poland, Japan, Spain, Mexico, Greece and Czechoslovakia) in which the Institute was meeting for the first time. In each case the session led to a marked increase of interest in statistics and a realization of the need for it if the country welcoming the Institute was to be governed with intelligence.

That the Institute survived the second World War, as it had survived the first, was due in large measure to the same two favoring circumstances, first, the existence of a Permanent Office under wise leadership which continued to publish although fitfully in the face of increasing obstacles, and, secondly, the Institute's acceptance before each war broke out of an invitation to hold its next meeting at a certain time and place, together with support adequate to get the invitation revived after the session had been postponed by the war.

In the preceding sketch emphasis has been placed on the initial success and the ultimate failure of the German Government to displace French by German as the international language and to block the continuance of international statistical organizations based on the equality of all nations participating. This has been done partly because it seemed an important but neglected part of the history and partly because it leads us to hope that the experiences of statisticians with Germany may be repeated some day with Soviet Russia.

Now a new constitution of the Institute has been approved and adapted to the conditions of today, a supporting regional organization covering the Western Hemisphere has already been established, and there is a chance that other organizations will arise elsewhere; now, too, relations between the Institute and the United Nations are more cordial and cooperative than the relations it had with the League of Nations. With these advantages and with a plethora of statistical problems calling for study, the outlook for international statistics seems en-

courageously bright. Certainly great progress has been made in the century since the Prince Consort began to prepare for the London Exhibition.

## A CASE STUDY OF THE INTERNATIONAL COLLECTION OF DEMOGRAPHIC STATISTICS

FORREST E. LINDER<sup>1</sup>

**E**ARLY in 1947 the United Nations Statistical Commission made a recommendation that "demographic data concerning all the countries of the world be assembled and published by the United Nations." Two weeks later this recommendation was made more specific by the Population Commission, which recommended the publication of a Demographic Year Book and that the "target date of publication of the first issue be 1948 and as early as practicable in that year."

Simultaneous with the recommendation that this task be undertaken by the United Nations Secretariat, the Population Commission formulated the further instruction that "statistical matter published in the year book shall be taken from the official statistics published by the separate governments, or supplied by the separate governments, or calculated by the Secretariat with the consent of the separate governments concerned."

The problems of the international collection of demographic statistics can be studied in many ways. For each variable of interest in the population or in the vital statistics field, there are the problems of geographic coverage, there are questions of quality and accuracy of the obtained data and there is the difficult subject of the comparability of the definitions and classifications used by each country in its own collection and compilation. A systematic investigation and discussion of these questions would be a life-time task. And rather than to present a fragment of such a survey, in these few minutes, I have thought that it would be of greater interest to give a brief factual analysis of the results to date, of the above recommendations of the Statistical Commission and the Population Commission. In contrast to a general or theoretical discussion,

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this is more in the nature of a single clinical case history. Even this case history is further limited to a discussion of geographic coverage, without considering the equally important and much more difficult aspect of the quality of data.

The recommendations of the Commissions called for a broad coverage of data both geographically and by subject. At the same time the restrictions as to the sources of data to be used were rather rigid. These two considerations practically determined the general procedure for collection. The present library facilities of the United Nations do not include a complete collection of official statistical publications. The use of secondary sources is almost excluded by the limitation that data published must be officially supplied data.

Under these circumstances it was decided to send to each country a detailed questionnaire requesting *de novo* all of the historical and detailed demographic data which would be used in the year book or which, entered in the files of the Statistical Office, would form the foundation for future compilations or special studies.

A questionnaire was prepared containing thirty-three tables giving time trends and cross-classifications of area, population, births, deaths, stillbirths, marriages, and divorces. In addition to statistical data, detailed statements were requested on definitions, accuracy of data, special groups included or excluded from the figures, and other information which would be important for the correct interpretation of the statistical figures.

This questionnaire was prepared and printed in three languages—English, French, Spanish. Concurrent with the preparation, translation and printing of the questionnaire, consideration was given to the list of countries or areas to which the questionnaire would be sent. A geographic survey of the various political units of the world resulted in a list of approximately 250 sovereign countries, dependencies, colonies, trust territories, condominiums, international administrations, etc. This list of 250 areas became the basic distribution list for the demographic questionnaire, and represented the administra-

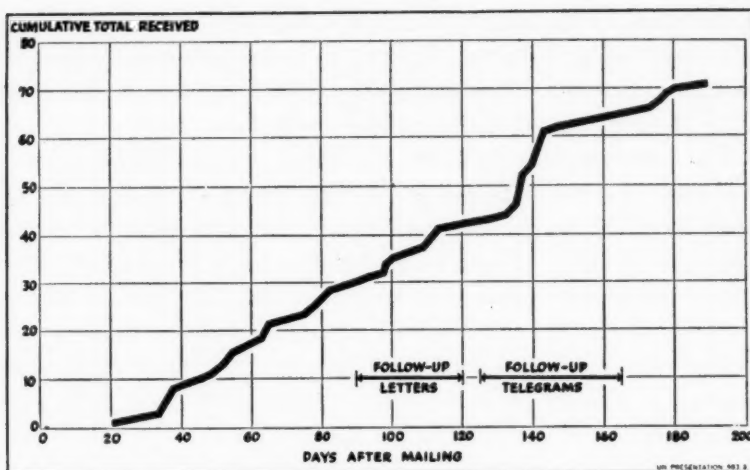


Fig. 1. Cumulative total of U. N. demographic questionnaires received, October 15, 1948.

tive sub-divisions of the world for which an attempt would be made to obtain demographic information.

The English language questionnaires were mailed in late March of 1948, the French questionnaires the middle of April, and the Spanish questionnaires early in May. All were sent by air mail. Figure 1 shows the rate of return. Approximately three to four months after the original mailing a follow-up letter was sent. During the fifth and sixth month a cable urging a prompt reply was sent to countries that had not answered. The chart gives some indication of the stimulating effect of the follow-up correspondence.

The net result, up to October 15, 1948, of these three formal contacts extending over a period of six months, with the responsible statistical agencies has resulted in the return of seventy-one questionnaires. At first glance it may seem that the international collection of demographic statistics is a very slow process. Yet the returns from this survey, taking advantage of the prestige and good will of the United Nations, are in general far better than has been the previous experience of international agencies. Slow as the process is, these returns

represent a high degree of cooperation on the part of the national statistical offices.

Figure 2 gives more specific information on the geographic distribution of the countries which returned or did not return a questionnaire. The seventy-one returned questionnaires do not by any means all represent important areas of the world. They range, in population, all the way from Campbell Island with a total population of five lonely male souls, to China with over 400,000,000. All together, the seventy-one returns cover 66.4 per cent of the world's population. And the approximately 180 unreturned questionnaires cover the remaining third. An examination of the map indicates that we have failed primarily to get returns from most of Africa, from the majority of the countries of the Middle East, from the countries and dependencies of southeast Asia and from the U.S.S.R.

It is the main purpose of this paper to discuss the adequacy of the data given in the seventy-one questionnaires which were returned up to October 15, 1948. It must not be assumed, however, that no data whatever exist for those areas for which a questionnaire was not returned.

To place the analysis of the returned data in proper perspective, a further examination is desirable for the areas for which data were not received. This examination may be made by considering separately the section of the bar chart in Figure 2 which represents the 33 per cent of the world's population for which no questionnaire was received. Figure 3 shows this part of the bar divided into sections according to the probable status of data for that portion of the world's population.

Speaking in general terms, it may be said that practically no data of any kind exist for about 8 per cent of the population. This segment includes such demographically unmeasured areas as Ethiopia, Afghanistan, Haiti, and most of the countries of the Middle East. For these areas, systematic data, either of the census or of the registration type are practically nonexistent.

Another 8 per cent of the world's population can be put in

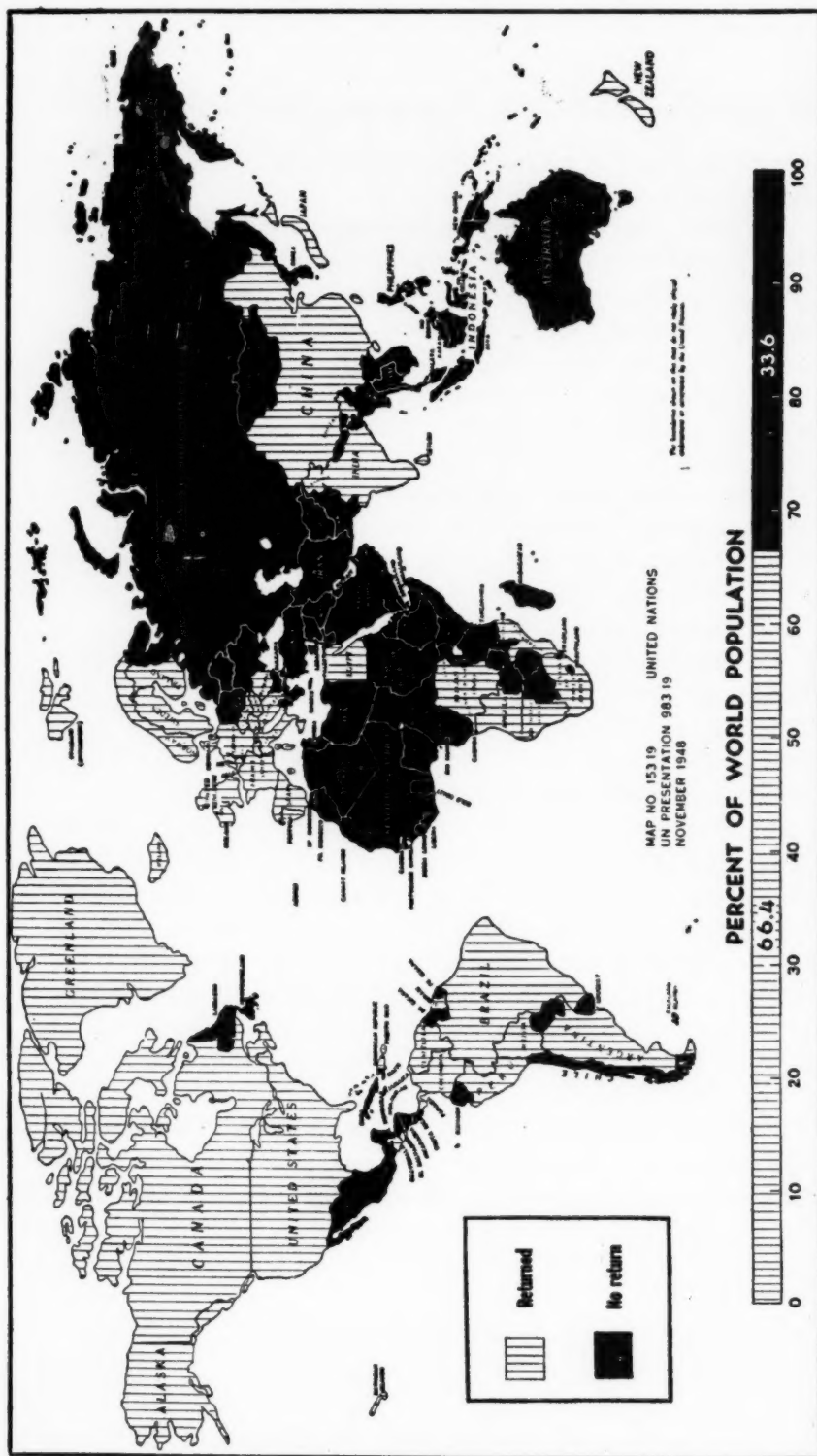


Fig. 2. Analysis of returns from U. N. demographic questionnaire, October, 15, 1948.

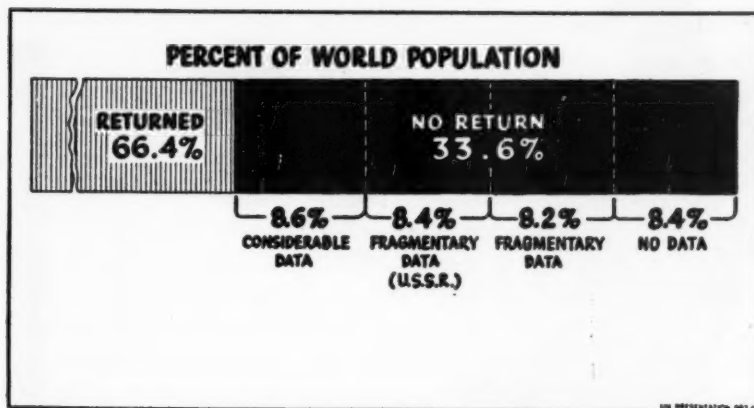


Fig. 3. Data for populations *not* included in U. N. demographic questionnaire returns.

the group for which fragmentary data only are available. For these areas there may be a summary census which gives total population with some data on composition. For other areas in this group there may be available some registration data but no population enumeration. This group of countries includes practically all of the colonies, dependencies and trust territories of Africa, most of the Caribbean and some countries of South America, and many parts of Southeast Asia.

Another 8 per cent of the world's population for which no questionnaire was returned is the population of U.S.S.R. This area may also be included in the group for which only fragmentary data is available. From the 1939 U.S.S.R. population census, total population and some classification by characteristics can be obtained. But other than this, little uniform systematic data of recent date is available. Demographic analyses of such areas can be made only by a laborious process of fitting together the available fragments and supplementing these with estimates and speculation.

The remaining proportion represents parts of the world for which fairly adequate data presumably exist but for which this particular questionnaire survey up to October 15 failed to get returns. This group includes such areas as Australia, Bulgaria,

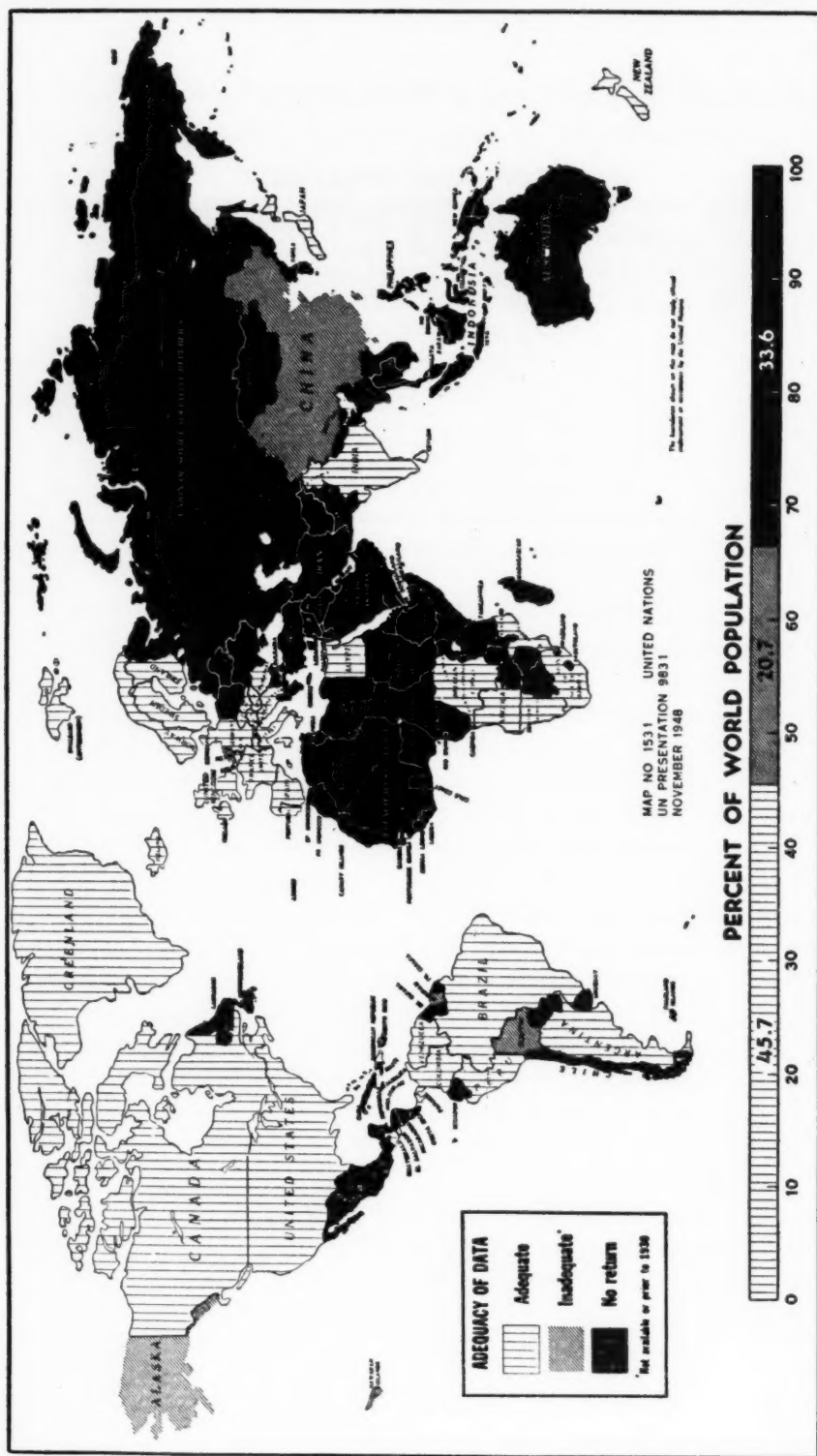


Fig. 4. Enumerated population. Analysis of returns from U. N. demographic questionnaire, October 15, 1948.



Chile, Greece, Mexico, and Poland. For some of these areas a substantial amount of data is available. For certain of them, we are informed that questionnaires are being prepared or are in the mails. For others, pre-war data can be found but disturbances of the recent war have not permitted the establishment of adequate post-war statistical services. Potentially, this final 8.6 per cent could be added to the 66.4 per cent for which data were returned.

The above discussion may be summarized in this manner. Questionnaires were received for approximately 66 per cent of the world's population. If this analysis were postponed for several months and if questionnaire data were supplemented by available material from library sources, this 66 per cent could be increased to 75 per cent. For approximately 17 per cent of the population some fragmentary data could be found and for the remaining 8 per cent essentially nothing is available. In examining the data for areas for which a questionnaire was returned, the probable status of data for the other areas of the world can be kept in mind.

A summary analysis of the data returned on the questionnaires can be made by examining a few typical items. Figure 4 shows the countries which answered the questionnaire giving an enumerated census figure for the total population. In this and the following charts, three broad classifications of the data returned on the questionnaires can be used. The first classification includes the approximately one-third of the world's population for which no questionnaire was received. The second class may be termed "inadequate data." This class refers to areas for which no information was given or for which the information related to a period prior to 1930. If no information for a given item is available since 1929, the status of data for that item for that area is defined for the purposes of this study as inadequate. The third group, "adequate" data, includes areas for which some information has been given on the questionnaire for some year since 1929. Admittedly this definition of "adequate" is rather liberal, but a definition referring to a

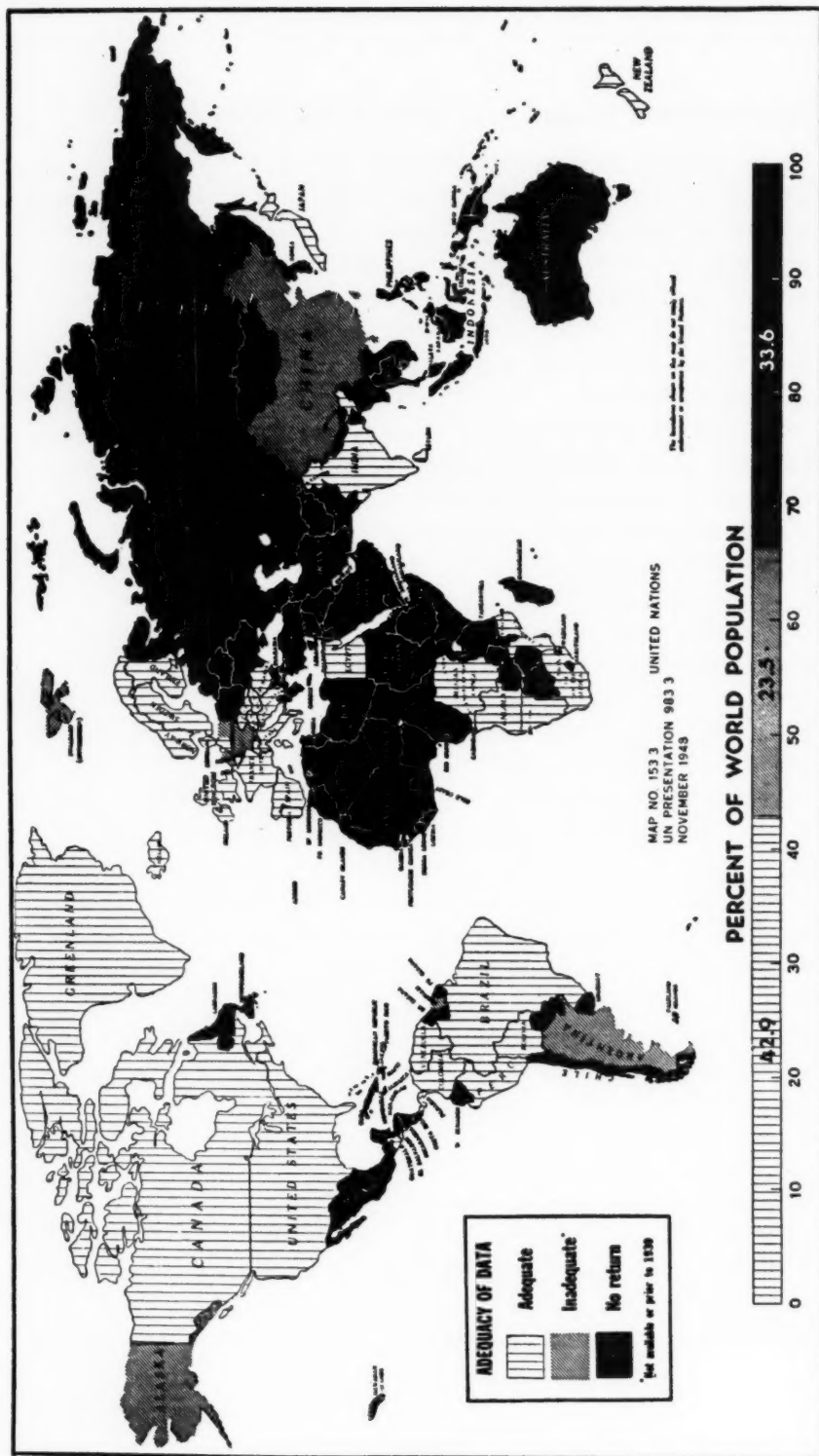


Fig. 5. Population by age and sex. Analysis of returns from U. N. demographic questionnaire, October 15, 1948.

shorter time period would have eliminated from the "adequate" group many highly statistically advanced countries whose regular decennial census tradition was interrupted in 1940 and 1941 by the war. It might be emphasized that the term "adequate" as used here, refers only to the simple existence of data, and not to the extremely complex question of the accuracy or international comparability of those data.

The shading on the map shows the various countries in each of these classifications and the bar chart at the base of the chart shows the per cent of the world's population represented by total population of the group of areas in each class.

Using these broad categories, a few charts will indicate the extent to which the questionnaire has been successful in collecting data.

As stated, Figure 4 shows the areas for which the questionnaire returns gave an enumerated population total. From this chart we see that for approximately 45 per cent of the world's population the questionnaires obtained a census figure pertaining to a year since 1929. Practically all of the returned questionnaires gave this information with the major exception of China which makes up almost all of the 20 per cent marked "inadequate."

In reference to this item of enumerated population, it may be stated that the greater part of the "no returns" group could be classed with the "adequate." From other sources it is known that about 75 per cent of the world's population has been covered by a "census" since 1929. It does not follow that all of these "censuses" have met high standards of a modern type enumeration, but at least for population totals, they must be considered as in the census class.

Figure 5, which gives information on population by age and sex, shows essentially the same picture. Here it is indicated that age-sex data has been received for almost 43 per cent of the world's population. China again represents the major unit for which a questionnaire was received but for which data on this item are lacking. This is also true for all following popu-

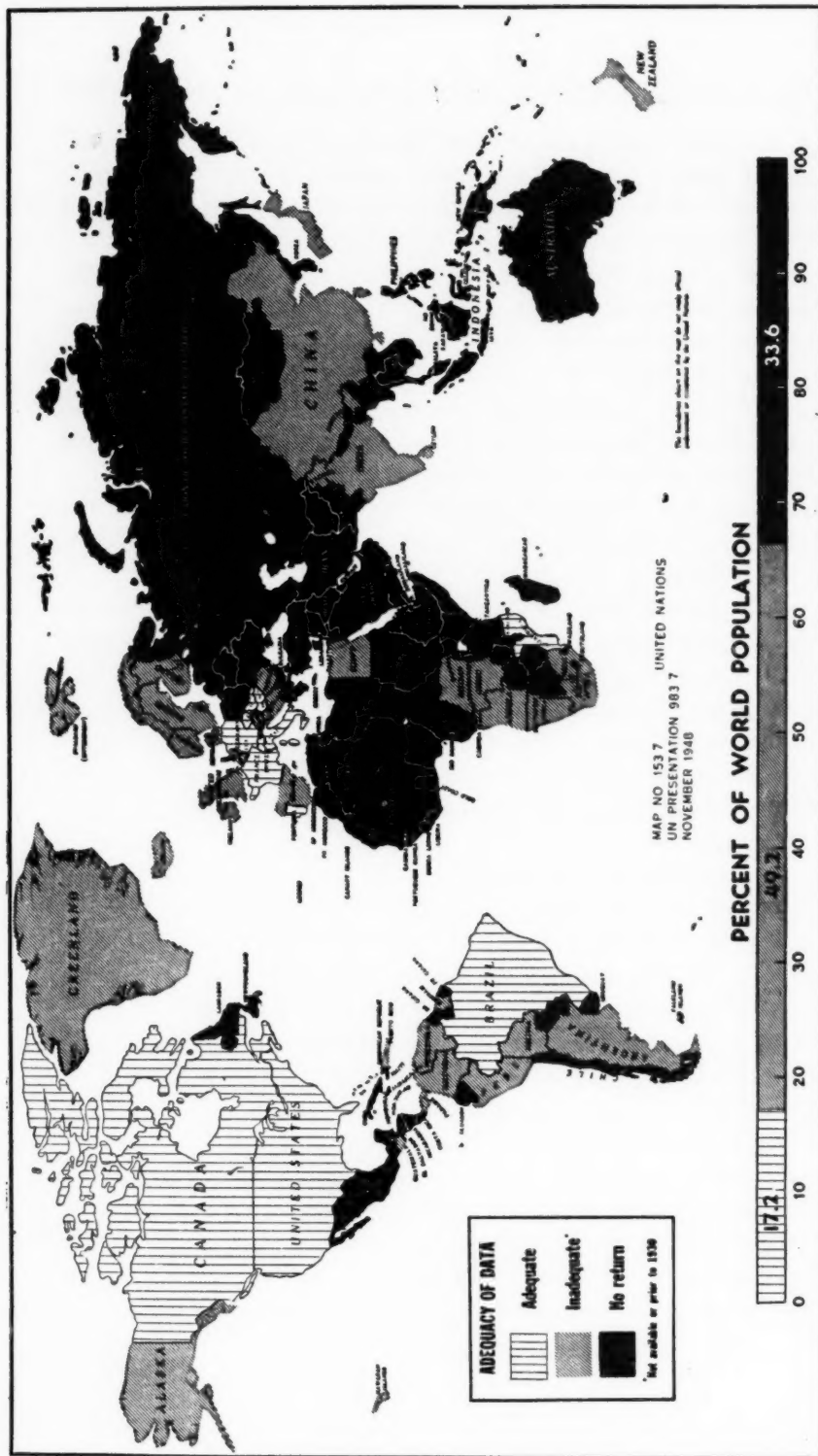


Fig. 6. Female population by number of children ever born. Analysis of returns from U. N. demographic questionnaire, October 15, 1948.

lation and vital statistics items. In general if a census includes more than a simple count of persons, it includes age-sex information. For this reason a good proportion of the areas for which no returns were received probably could be ultimately included in the group for which some data are available.

If we were to examine maps for other standard census items such as marital status, urban-rural distribution, the charts would be very similar to this one, although even more serious questions regarding comparability of definitions would arise. However, in reference to another group of population items, there would be found to be a much less uniform coverage. Such items as race, citizenship, language, country of birth are not of universal interest and each appears as a census item only in those countries where it is of particular importance. This type of item appears on most lists of recommended census items, but their interpretation and application differs from country to country. They may be considered as demographic items of particular, not of general, interest and should be collected only for those areas where they are sufficiently valuable.

Other items, however, of almost completely universal applicability from the standpoint of demographic analysis are even less available. Figure 6 shows the returns on the questionnaire for the distribution of female population by number of children ever born. Such data were returned for only 17 per cent of the world's population. Previously, in reference to total population and age-sex data, it will be recalled that a large part of the 33 per cent included in the "no returns" group were considered as potentially in the adequate group. However, in reference to items such as this, the questionnaire returns probably include practically all of the data which actually exist. The extremely inadequate information on fertility data of this type is further emphasized by Figure 7, which shows the areas giving data on female population by number of children now living. Such information was received for only 2.5 per cent of the world's population and it is doubtful if much of the 33 per cent of the "no returns" could be moved into the

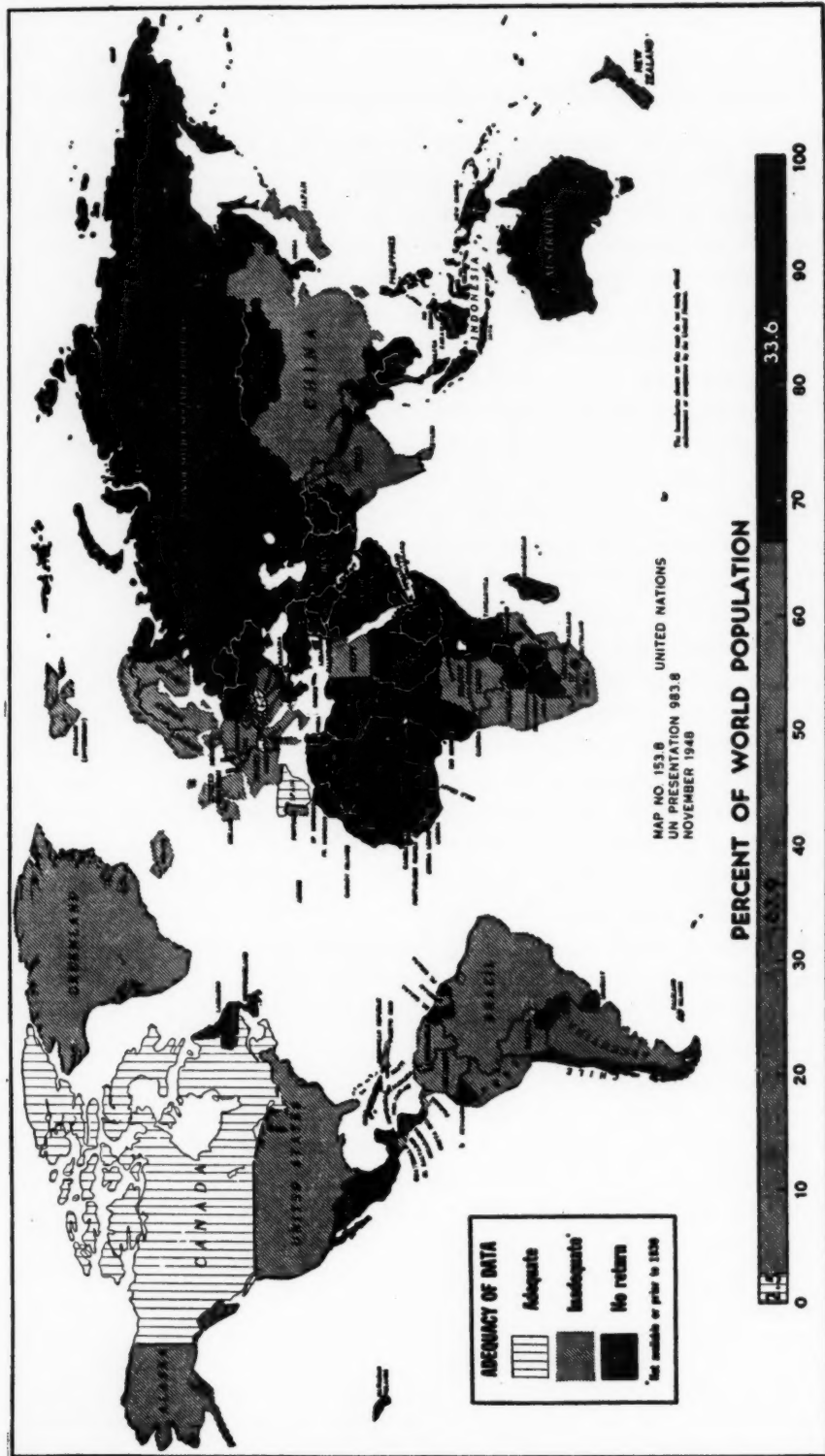


Fig. 7. Female population by number of children living. Analysis of returns from U. N. demographic questionnaire, October 15, 1948.



"adequate" classification. It is obvious that demographic analyses derived from material of this kind can have only a very limited geographic interpretation.

The adequacy of vital statistics, that is registration type data, is in general somewhat less satisfactory than for enumeration data. In making a dichotomy between "adequate" and "inadequate" data, the same criterion has been used—namely the return on the questionnaire of some data for a given item for some year since 1929. However, if vital statistics are available for any one year in this period they are usually available for most years except recent ones, because registration is a routine annual procedure rather than a periodic procedure such as an enumeration.

Figure 8 shows the areas for which birth and death totals were returned on the demographic questionnaire. It may be seen that such total data are available for only approximately 40 per cent of the world's population. This percentage could be increased only by the addition of a very small amount from the 33 per cent of the "no returns." Large areas such as the U.S.S.R. for which some census type data can be found, have made available almost nothing in the field of vital statistics. Similarly, the African colonies, Southeast Asia, and other areas which sometime during the past eighteen years have compiled some data on total population, have produced only fragments of registration data.

When it is stated that total birth and death figures are returned on the questionnaire for approximately 40 per cent of the world's population, it must be repeated again that this figure is based on a liberal definition of adequacy. If the data were analyzed further to determine which data were acceptable from a standpoint of completeness and accuracy of registration, the percentage of the population for which good data are available would undoubtedly be much smaller. Even parts of the United States might fail to satisfy a reasonably strict criterion. Such an analysis must at some time be done, but at the present time few national statistical offices, and certainly

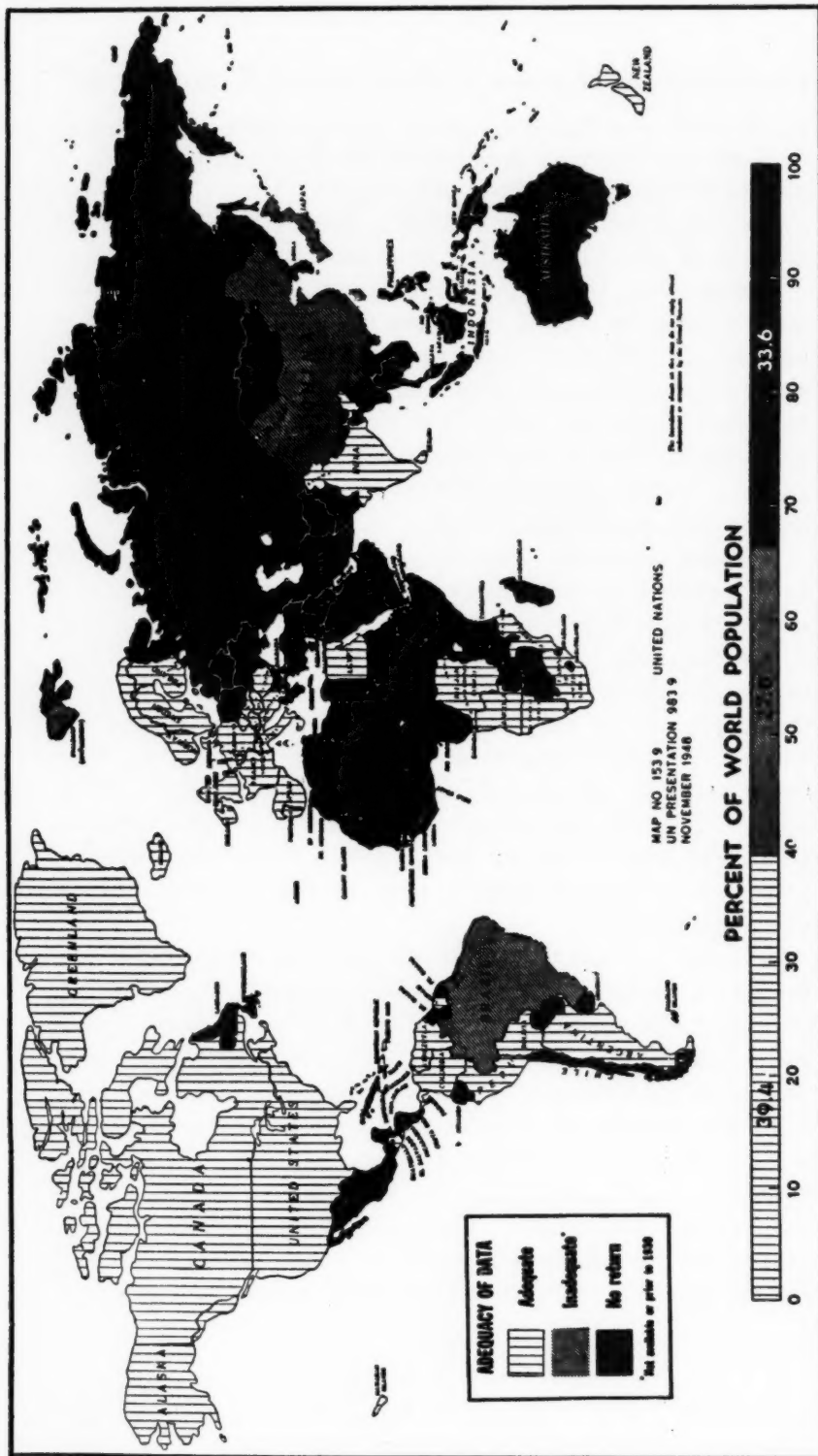


Fig. 8. Total deaths and live births. Analysis of returns from U. N. demographic questionnaire, October 15, 1948.

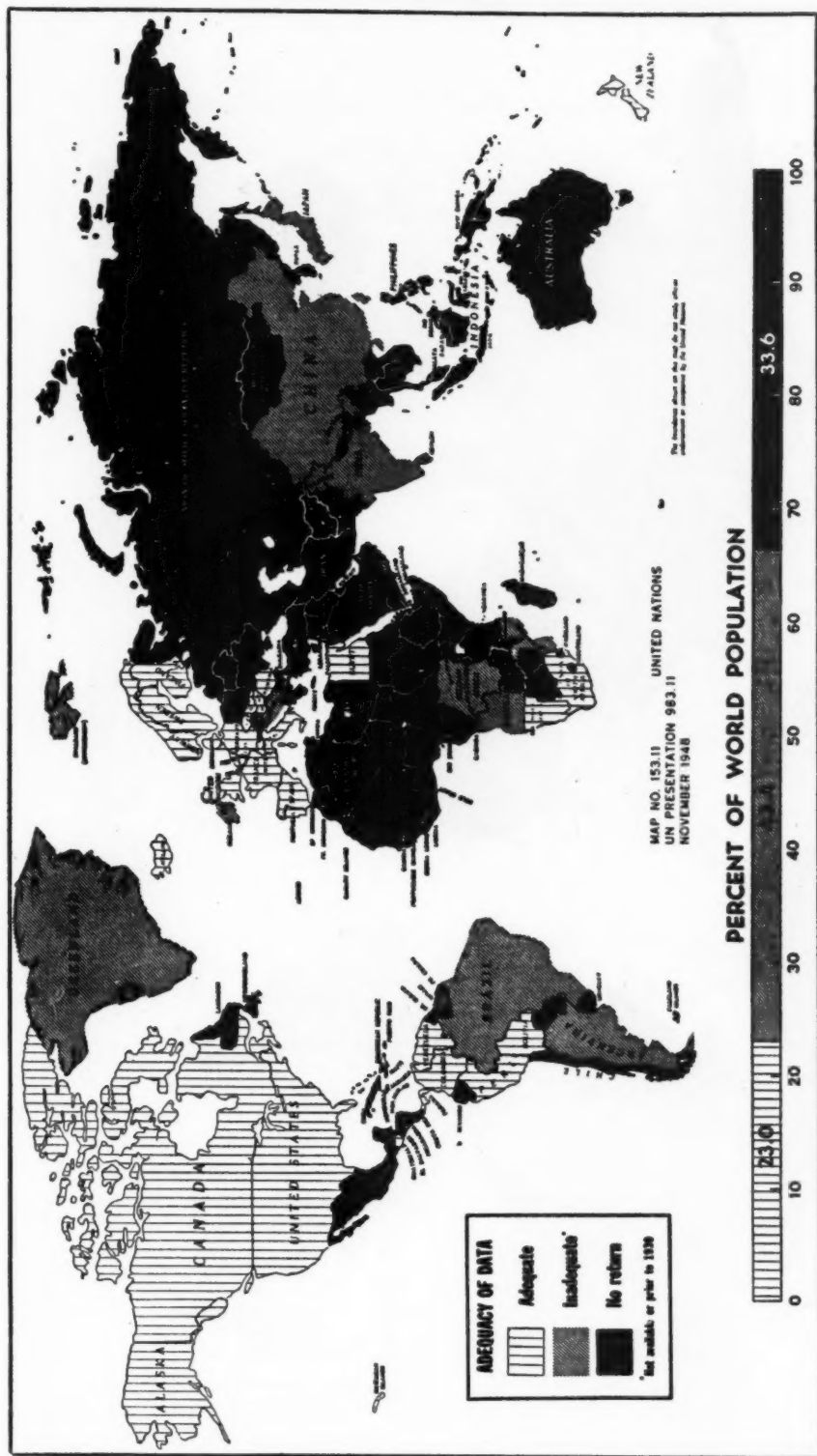


Fig. 9. Births by age of mother. Analysis of returns from U. N. demographic questionnaire, October 15, 1948.

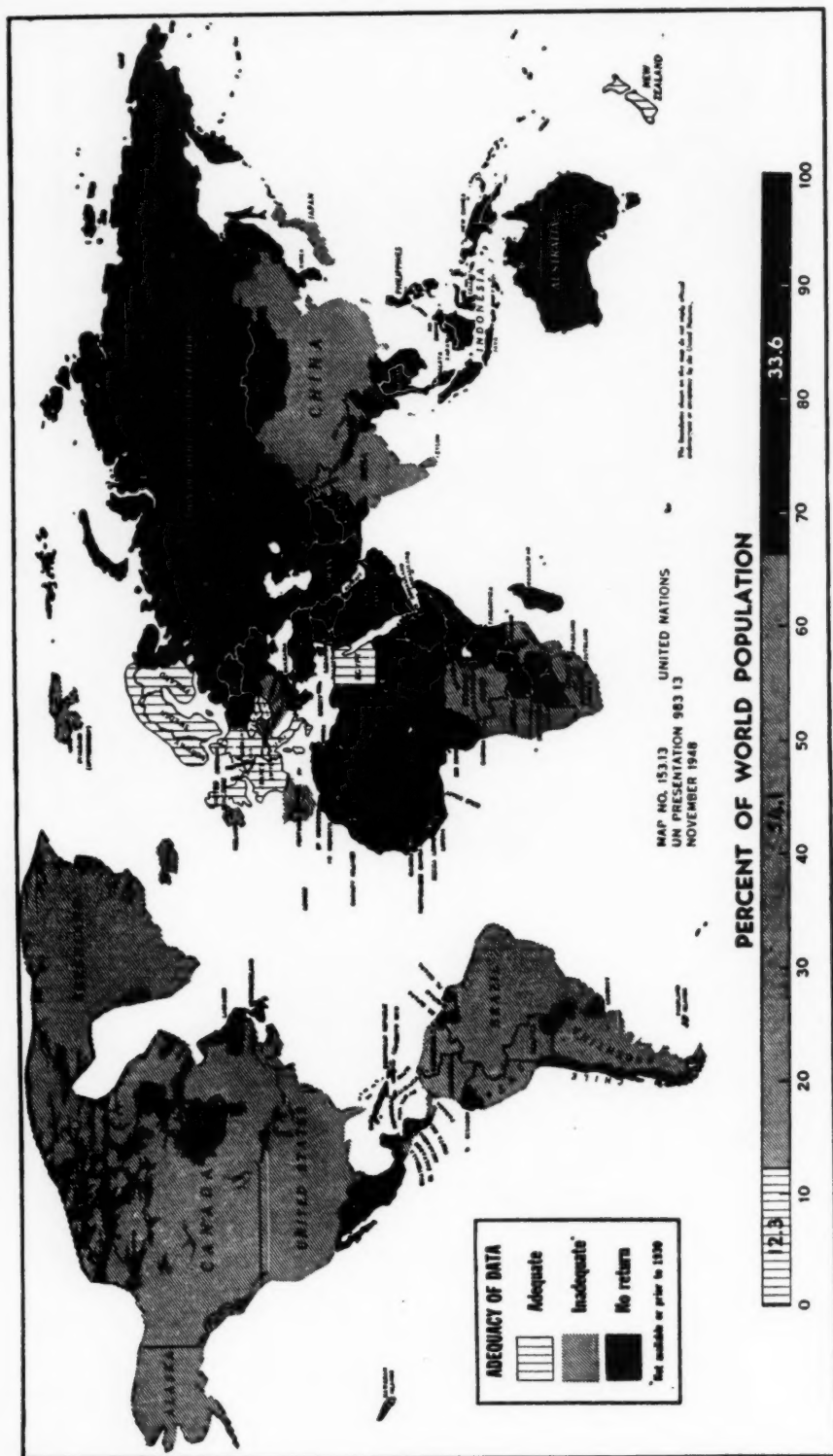


Fig. 10. Births by duration of marriage. Analysis of returns from U. N. demographic questionnaire, October 15, 1948.

no international statistical office, has the facilities or the facts necessary for an objective and thorough evaluation of quality of the data which it collects and publishes.

Adequate demographic studies cannot be based solely on total population, birth and death figures. Figure 9 shows the returns of data for births by age of mother. Information on this important subject was returned for only 23 per cent of the world's population. Large areas and sections of the world show as black or shaded areas. Here again it is doubtful that much of the dark areas can be transformed to hatched. And also for some of the areas shown hatched the available figures may not cover all of the population of that area. As can be seen, data by age of mother is available primarily for North America and Europe. Information on the number of births by the age of the mother and parity is available for the even smaller percentage of 19.

Figure 10 shows that data on number of births by duration of marriage have been returned for only 12 per cent of the world population. In this case the 144,000,000 population of the United States and the 12,000,000 population of Canada for which data are available on most all other items are missing.

The situation with regard to mortality data is slightly better. As seen previously, mortality totals were returned on the questionnaires for some 40 per cent of the total peoples of the world. Breakdowns of this total are more generally given than for sub-classifications of birth data. Whereas births by age of mother was given for 23 per cent, deaths by age of decedent was returned for 37 per cent. The areas included are shown in Figure 11. Other classifications of mortality data, such as deaths by month of death, infant deaths by subdivisions of the first year of life, are given for approximately the same areas.

Of all the various types of general data with which a demographer is primarily concerned, data relating to marriages seem to be the most inadequate. Figure 12 shows the areas which returned information on total marriages. These include scarcely more than one fourth of the world's population. Marriage data

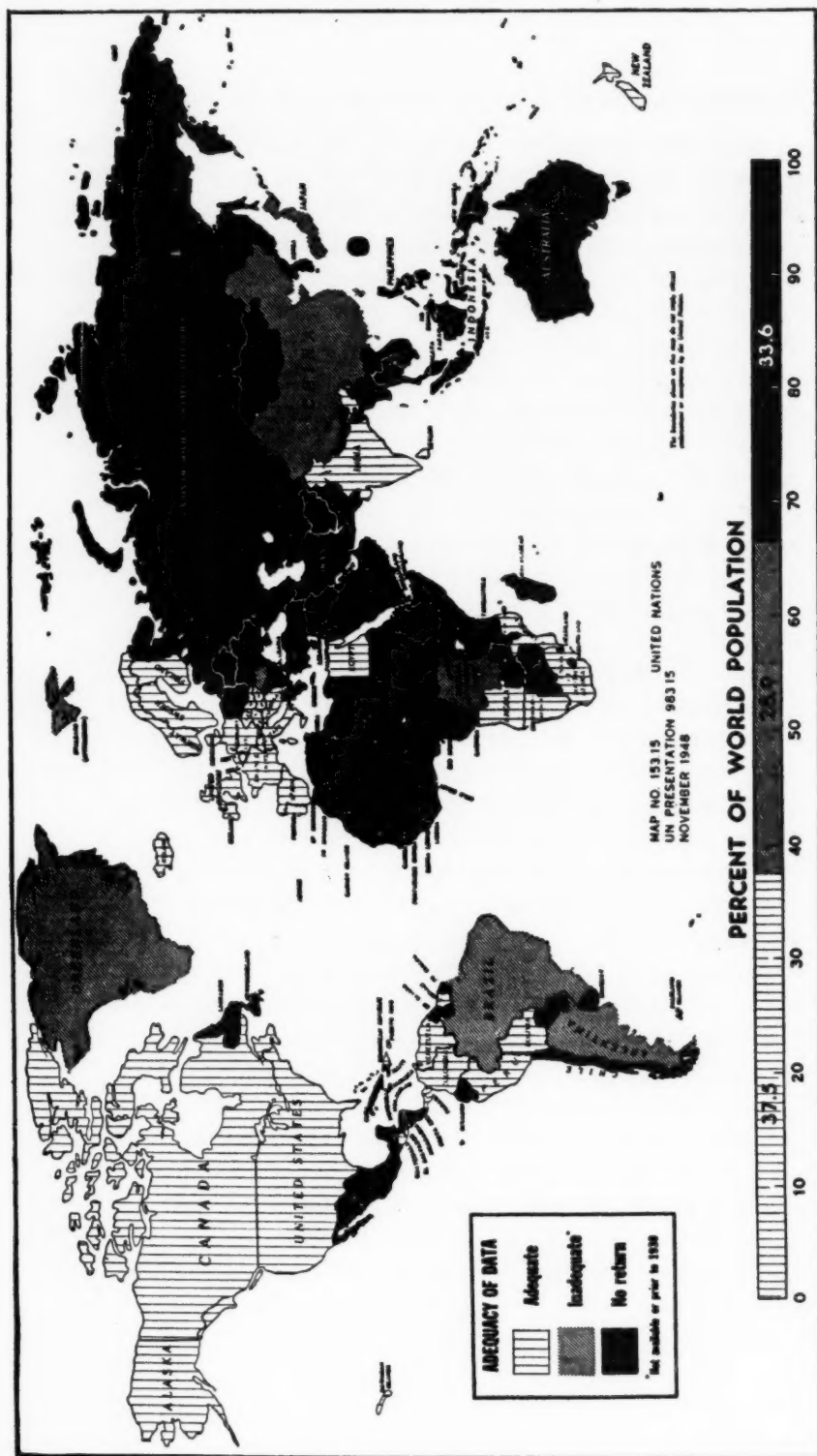


Fig. 11. Deaths by age and sex. Analysis of returns from U. N. demographic questionnaire, October 15, 1948.





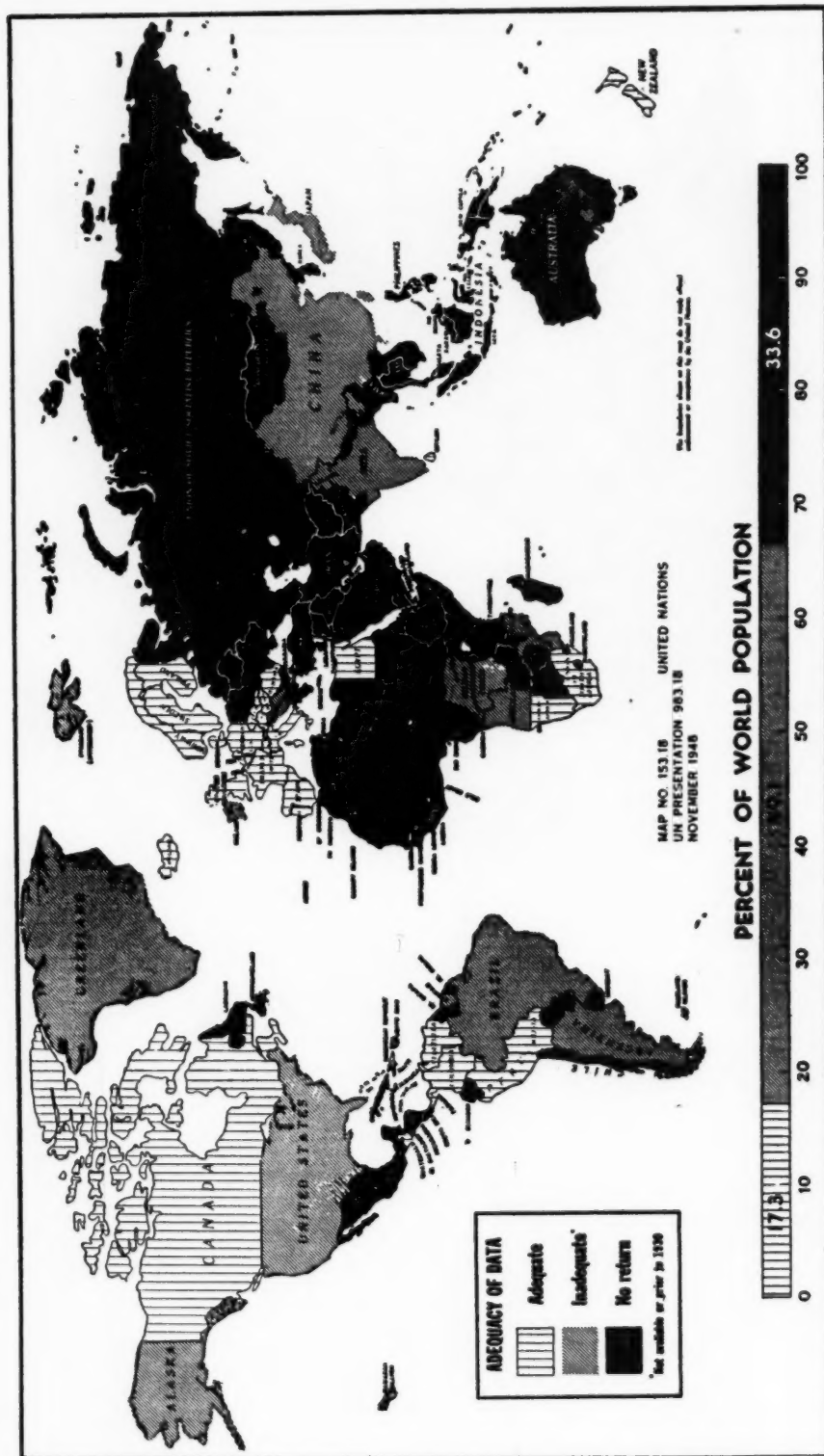


Fig. 13. Marriage by age of bride and groom. Analysis of returns from U. N. demographic questionnaire, October 15, 1948.

by characteristics, such as marriages by age of participants, are shown in Figure 13 to be returned for only 17 per cent. Looking upon the matter from this world-wide geographical viewpoint one conclusion regarding the United States becomes strikingly evident. That is, that marriage statistics—marriage statistics in the population census, marriage data in birth and death statistics, and statistics on marriage itself—have been very seriously neglected by the United States.

Perhaps if we can speak in very rough approximations, the facts shown on the various maps, together with an appraisal of the status of data for areas not returning a questionnaire, can be summarized in this manner. For approximately 75 per cent of the world's population it is possible to get a fairly recent (since 1929) enumerated or total census figure. The accuracy and detail for these figures would vary enormously. For the most usual breakdowns of population data, i.e. by age, sex, and marital status, data can be found for possibly 50 per cent of the world's total number of people. But for items more specially related to fertility analysis, such as female population by number of children ever born, certainly less than one-fifth of the world is covered.

Total birth and death figures are available only for slightly more than 40 per cent of the world population, and detailed classifications of birth figures by fertility items can be obtained for about one-fourth of the world.

These estimates can be highly discouraging or highly encouraging depending upon the philosophical point of view which you wish to take. It is certainly obvious that the data which are available are in no sense a random or a representative sample of the populations which we wish to study. And, accordingly, it must be concluded that it is not possible at this time to make a scientific and adequate presentation of the existing demographic situation or of trends for the world as a whole. This deficiency is unfortunate and may be even catastrophic because in a closely interrelated world a neat demographic analysis of one region for which data may be available is not

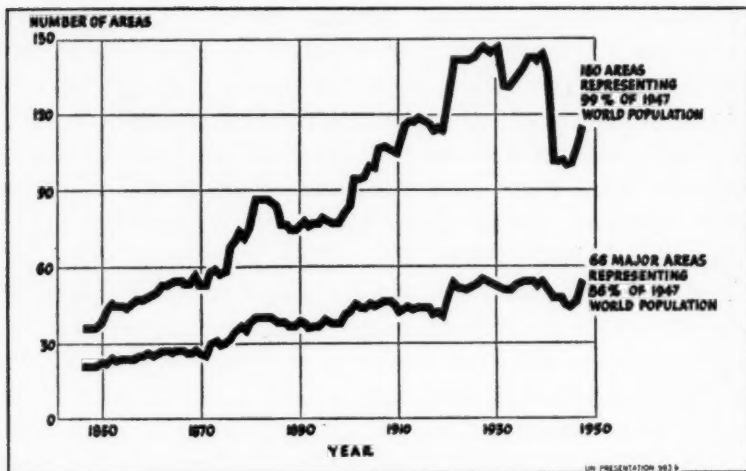


Fig. 14. Number of areas having a "census" within a decade of each year, 1847-1947.

necessarily an indication of what may be happening in the larger portion of the world which remains black on our maps.

From another point of view these estimates of available data can be viewed optimistically as a partial result of a long, slow but ever improving development of demographic statistics. The next chart will illustrate this point. Figure 14 presents certain facts from a compilation of data on the census history over the past century of some 180 areas of the world.

In 1947 these areas represented 99 per cent of the world's population. The line chart shows for each year of the past century the number of these 180 areas which, at any given year, had had a census within the preceding decade. The chart also gives a similar curve for sixty-six major areas representing 86 per cent of the 1947 world population. The downward drop at the end of the curves shows the disrupting effect of the war and this it is hoped will be compensated for by the unusual census activity focusing on 1950. The inevitable upward trend of these curves is an adequate demonstration that, if one is prepared to think in terms of generations or centuries, then demographic statistics are making substantial progress forward.

However and unfortunately, we may not be left alone to think in terms of generations and centuries. The demographic problems of the world may be upon us in much more urgent form before this slow process of statistical evolution has matured.

In this connection we may point out that there is a sharp difference between demographic statistics and some other types of statistics which the world uses to appraise its problems. In the fields of financial, trade, and production statistics, there is a strong positive relation between the existence of the problems and the existence of the data needed to study those problems. Countries with important foreign trade tend also to have foreign trade statistics. Countries with major financial responsibilities tend also to have the corresponding data. Countries with big production of oil, steel, or automobiles tend to parallel the production of material with the production of data measuring that activity.

However, in the demographic field quite the contrary is true. In this sphere it is found that countries with the greatest demographic problems are precisely those with the least data to measure and study those problems. Areas with the greatest relative production of people (in terms of births) and the greatest relative consumption of people (in terms of deaths) are exactly those for which human production and consumption figures are least available.

This negative correlation in relation to demographic statistics should indicate to the demographer that international compilations of official data will hardly serve his needs for studying his major problems.

The official agencies can gather in, collate, and publish material which is available for parts of the world where adequate census or registration procedures are functioning. But official agencies are not in a position to make a major contribution to the collection of data in the rest of the world.

It is obvious that for these other and major areas, new techniques and new methods must be found. Here is an open field

for the private investigator, the research worker who can construct a reasonable appraisal from the fragmentary data which can be found, or supplement these data with field studies and surveys.

It may be that substantial thought and resources should be directed to devising methods for penetrating the fog of demographic ignorance which envelops those areas outside the scope of official international statistical compilations.



## WORLD HEALTH STATISTICS

KNUD STOWMAN<sup>1</sup>

IT IS a cause of rejoicing to be able to speak here today of World Health Statistics, not as one of the many desiderata still needed as a basis for a vigorous and wholesome international life, but as an accomplished fact. When we are now primarily concerned with further extension, betterment of quality, and problems of comparability of world health statistics, our younger colleagues are apt to forget that the very creation of the system is of such a recent date that several of its pioneers are still with us.

More than thirty years ago, while in the service of the Prudential Insurance Company of America, one of my daily tasks consisted of preparing ratings for extra life insurance premiums payable by Americans who were foolhardy enough to insist on travelling abroad. Our collection of mortality statistics and of information on health conditions in foreign countries was one of the very best existing at the time. Nevertheless, by far the most weighty ingredient of the brew was an arbitrary loading. Today there is a steady flow of valuable information from all parts of the world, and it is readily and promptly accessible to anyone who takes the trouble to ask for it.

The history of health statistics as an international enterprise falls into three major periods. The first period, which lasted up to 1921, was characterized by private initiative. Then came the League of Nations period of a quarter of a century's duration. The third period, barely arising from our blueprints, is under the auspices of the United Nations and its specialized agencies, notably the World Health Organization.

While inter-governmental organizations have taken the lead since 1921, private initiative is not dispensed with. Also, it should be remembered that no organization, however strategically placed, is better than the men who furnish the leadership and the daily work.

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Prior to World War I, the International Statistical Institute and the Office international d'Hygiène publique took a limited interest in public health statistics. The former never went beyond demographic statistics, and the latter practically confined itself to the maritime quarantine diseases. The League of Red Cross Societies appeared upon the scene in 1919. Its statistical thinking was still along pre-war lines as shown by the name of its unit concerned: Department of Vital Statistics. It was soon realized that health statistics are essentially a government function, and in October 1921 the Department was transferred to the League of Nations where, integrated in the new Health Section, it became the nucleus of the Epidemiological Intelligence Service. For the first time proper machinery was available for international collection, analysis, and publication of health statistics. This development meant that the decisive step from statistics of deaths to statistics of cases could now be attempted on a worldwide basis.

Mortality statistics were not neglected, but our efforts were concentrated on morbidity statistics, and among these, chiefly on epidemic diseases. More information was available regarding these diseases, and their control rated highest among the tasks of the new service. A *modus vivendi* was established with the pre-existing agencies. The Singapore epidemiological station was opened in 1925. As early as 1923, monthly and annual epidemiological reports had replaced previous reports appearing at irregular intervals. Regular Weekly Epidemiological Records were taken in hand in 1925; their serial number is now in the 1180-ies, and there has never been any interruption. Daily reports and epidemiological broadcasts followed. Gradually, the published data extended to such diseases as tuberculosis, malaria, and syphilis.

In the course of a few years practically every country and colony throughout the world was reporting to the best of its ability. Naturally, the data were of unequal value, and our reports always contained warnings to that effect. Looking backward over these twenty-seven years from the establish-

ment of the League of Nations Health Organization there can be no doubt that material progress has been made in both quality and quantity of information. The factors contributing to this progress may be roughly grouped under four headings:

1. The amazing growth during this period of the science and application of public health.
2. The emulation produced by the current publication and constant utilization on an international level of national public health statistics.
3. The frequent personal contacts of leaders in public health and statistics through expert committees and study tours of the League of Nations Health Organization.
4. The actual recommendations of these expert committees and the publication by the League of Nations of handbooks on the organization of health and statistical services in the various countries.

For the first time adequate funds were available for furthering the work of international comparability of statistics—nothing lavish to be sure, but adequate for problems which were then ripe. I can best explain the advantage of this new state of affairs by a simple illustration.

Dr. Jacques Bertillon was the first successful pioneer of international comparability of mortality statistics, and his list of causes of death is to this day the cornerstone of that ever growing edifice. The third decennial conference for the revision of this nomenclature was overdue in 1919. Bertillon, who had retired, had been pressed into service as Director of medical statistics of the French army. I found him one bitter winter day in a wooden barrack on the old Paris fortifications; he was all wrapped up in blankets and every once in a while stooped to shovel coal into a small pot-bellied stove beside his desk. It had not been possible to scrape money together for the conference, he told me. The League of Red Cross Societies was persuaded to appropriate \$5,000 for the purpose.

A mere \$5,000 had to suffice to refloat this important work.

According to Bertillon's last wishes the List of Causes of Death followed us into the League of Nations Health Organization. A few years later we had four expert committees working on such questions as multiple causes of death, age grouping, confidential medical certification of causes of death, and definition of still-births far ahead of the next decennial revision. I shall leave the further developments of the international list of causes of death to Dr. John T. Marshall who took a prominent part in the work centering around the sixth decennial revision. The expansion of this work from the third to sixth revision furnishes one of the most striking illustrations of the growth of sound international collaboration in a suitable technical field.

The League of Nations was hard hit by World War II. World health statistics came out strengthened by the crucial test. The League of Nations Service of Epidemiological Intelligence and Public Health Statistics continued to function in Geneva, and it managed to obtain much valuable information from the other side of the fence which would otherwise have been inaccessible to us. In May, 1944, the League of Nations Health Research Unit was formed in Washington, D. C. In January, 1945, this Unit became the Epidemiological Information Service of UNRRA which, among its many tasks, had the execution of the 1944 international sanitary conventions. The semi-monthly UNRRA Epidemiological Information Bulletin furnished current and up-to-date statistics and analyses of the world health situation during two crucial years. In 1947 these activities were absorbed by the new World Health Organization.

The most important development in the field of health statistics which has ever taken place is certainly a comprehensive plan recommended by the Conference for the Sixth Decennial Revision of the International List of Causes of Death and adopted by the First World Health Assembly in Geneva in July 1948.

An Expert Committee on Health Statistics was established under the World Health Organization, and international tech-

nical conferences will be convened as occasion arises. All governments were invited to establish national committees on vital and health statistics composed of those entrusted with the compilation of such statistics. A list of problems urgently in need of solution was selected with special reference to international comparability and the subjects were distributed to the various national committees for their special attention. The member governments have accepted in principle, and a preliminary list of the distribution of subjects follows:

1. The competent authorities of Belgium, France and Switzerland will study the question of completeness and accuracy of medical certification of causes of death in relation to the confidential character of the certificate.

2. Those of Canada and the United States of America will prepare an adaptation of the International Statistical Classification of Diseases, Injuries and Causes of Death to the needs of armed services.

3. The Canadian and United States national committees individually or jointly will pay particular attention to the methods by which health statistics might be linked with other types of related statistics in such a manner that they will be based upon a knowledge of the characteristics and distribution of the population.

4. The vital statistics administration of Switzerland, the United Kingdom, and the United States of America will study methods of presentation of statistics of multiple causes of death.

5. The competent authorities of Denmark, France, Norway, Switzerland, and the United Kingdom will pay particular attention to the problem of cancer registers and statistics.

6. The competent authorities of the United Kingdom and of the United States of America will pay particular attention to the methods for obtaining reliable statistics on the frequency and causes of foetal death (classification of periods of gestation under twenty-eight weeks, classification of multiple causes, methods of certification).

7. The competent authorities of France and India will pay particular attention to the problems of morbidity and mortality from tropical diseases.

8. The competent authorities of Ecuador, India, Italy, and Venezuela will study the problems involved in the statistics of malaria morbidity.

The advantage of such a decentralized system is that the burden of indispensable spadework will be shared and that, therefore, the many urgent problems awaiting solution can be taken up at once. No single office or commission could hope to cope simultaneously with so many different difficult questions if it had to do all the preparatory work. The national committees will then report their findings from time to time to the expert committee of WHO for international consideration and co-ordination with the interested statistical services of inter-governmental organizations.

The WHO will also make a survey of instruction in health statistics given in the medical schools of the various countries in order to determine what action may be desirable in order to propagate knowledge of statistical methods in the medical profession. In general, the list of subjects to be dealt with is not exhaustive, but will be continuously revised. Already, the WHO Tuberculosis Committee has demanded help from the Committee on Health Statistics.

While new problems must be taken up as soon as they show promise of being ripe for solution, old problems cannot be neglected even though solved in theory. Thus, while a perfectly good definition of stillbirths made by the best experts was recommended to state members of the League of Nations as early as in 1927, it is high time to check up on whether effect has been given to this recommendation.

Needed now is a master plan specifying the kind of information which is desirable for local, national, and international appraisal of health conditions. No longer does it suffice to know how people die, we must know in what state of health or ill-health they live. Preventive medicine is not merely concerned with lifesaving. Its primary aim is to prevent sickness. Therefore, our aim must be constantly to enlarge the scope of mor-



bidity statistics and improve their quality and comparability. We must also have valid statistics of public health activities and other factors directly influencing the community state of health.

For simplicity's sake let us take our illustrations from the best known infectious diseases: How can a valid epidemiological study be made of smallpox or diphtheria without information on the state of vaccination and the types of the cases? How can the danger points for yellow fever be determined without current data on the *aedes* index? The danger from water, milk, or food-borne diseases can be appraised only when adequate sanitation statistics are available. X-ray surveys have little meaning so long as the now highly developed theory of sampling is disregarded, nor so long as no international definition of a pulmonary tuberculosis case and its stages has been adopted. The same need for definitions applies to the great amount of valuable information now available in tuberculosis case registers. Current information on B.C.G. vaccination and on bovine tuberculosis is also needed. And what about the definition of a poliomyelitis case or a rheumatic fever case, or a notifiable malaria case for the matter? How can morbidity records from social insurance statistics be utilized on an international scale?

Time allows us here to give only a few striking examples of problems urgently in need of solution. Their number is myriad, and we need a master plan for the strategy to be adopted in their solution. The WHO Committee of Expert Health Statisticians is the logical group to work out such a plan and distribute the tasks. A beginning has been made, and the form of organization adopted is far better than anything attempted in the past. However, as far as morbidity and other health statistics are concerned, the surface has only been scratched.

An attempt to devise a complete system of internationally applicable health indices was published 1936-1938 by the League of Nations Health Section and the Milbank Memorial Fund. The system was to a large extent inspired by the American Appraisal Form, which it subsequently influenced, but it

was far more comprehensive than its ancestor, especially in regard to background elements and statistical treatment. In December, 1937, these health indices were favorably received by the League of Nations Health Committee, but the work in Europe and in the League came to an end with the outbreak of the war. It was continued in South America where surveys based on the health indices system appear from time to time.

A perusal of these monographs may well serve as a guide to subjects awaiting solution, at least as far as the publication of statistics and studies of their comparability are concerned. After some twelve years have elapsed, the treatment of some subjects is out of date, which shows the need for constant revision. Whenever we get the master plan of health statistics, that, too, will need not decennial but annual revisions. The set-up of the WHO committee system is such that the necessary flexibility can be assured.

The present situation of world health statistics may be summarized as follows:

1. Demographic statistics are currently published by WHO and the UN Statistical Office. Problems of comparability are well in hand.
2. Statistics of causes of death will be published annually by the WHO, as they were in the past by the League of Nations Health Section. Their comparability is in course of rapid progress.
3. Epidemic morbidity statistics are published currently by WHO. Problems of comparability have hardly been touched.
4. Statistics of general and non-epidemic specific morbidity (such as from tuberculosis, malaria, certain organic diseases, mental disease, etc.) are not published on an international scale. Problems of comparability remain untouched.
5. Statistics of medical and public health activities and equipment are not internationally published. Problems of comparability have not been studied beyond national frontiers.

As you see, the statistical sun has barely risen over the international highway to health.

Lately, here in America, several vicious attacks against public health work have gained wide publicity. Vogt's *ROAD TO SURVIVAL* (a Book-of-the-Month-Club selection), Guy Burch's *HUMAN BREEDING AND SURVIVAL* (a Pelican Book), and a number of magazine and newspaper articles claim that the world is hopelessly overpopulated. According to these authors, the villains in the piece are the doctor, the health officer, the public health nurse, the malariologist, the TB man, and the laboratory girl. Without their work, the world would still be safe, they say.

Safe for whom? For germs and viruses, for lice and mosquitoes, and all the other causes and carriers of misery. Indeed, there can never be freedom from want, nor freedom from fear, so long as there is not freedom from disease. This is not the fifth, but the all-including freedom to be won. Public health work is now attaining a greater reduction of morbidity than of mortality which has already had some of its most obnoxious tentacles clipped. It tends therefore rather to augment the capacity for work than to increase the number of mouths to be fed.

I'm proud that today we can point to many volumes of international health statistics where there were none when I was young. I'm glad that a comprehensive organization is now set up to improve these statistics and to widen their scope. But we need the complete accountancy of our health work, a master plan of health statistics, which must never become static but always remain dynamic. Then we can confound the champions of disease, of invalidity, and of suffering. Then we shall see more clearly the road toward freedom from disease.

# SOCIAL AND PSYCHOLOGICAL FACTORS AFFECTING FERTILITY

## IX. FERTILITY PLANNING AND FERTILITY RATES BY SOCIO-ECONOMIC STATUS<sup>1</sup>

CLYDE V. KISER AND P. K. WHELPTON

ONE of the hypotheses to be tested in the Study of Social and Psychological Factors Affecting Fertility reads as follows: "The higher the socio-economic status, the higher the proportion of couples practicing contraception effectively, and the smaller the planned family." This may appear to be a self-evident statement in view of the accumulated studies on differential fertility and contraception. It is true that a large body of data, including results from the 1940 Census, shows a conspicuous amount of inverse relation between socio-economic status and fertility. However, most of these data are concerned simply with fertility and socio-economic relationships regardless of planning status. They give no clue as to the character of the relation among *planned* families.

Furthermore, in recent years, even the bulk data on differential fertility have been fairly uniform in their indications of exceptions to the inverse relation in the upper socio-economic classes. An example is afforded by Figure 1, which is based upon 1940 Census materials concerning the relation of monthly rental value of the home to total number of children ever born among native-white ever-married women 45-49 years of age in various regions and types of communities. In general, it indicates that whereas the inverse relation is rather consistently and sharply manifested below given rental categories, the fertility rates tend to level off or to turn in the other direction at upper rental levels. It will be noted that quite frequently not the top-

<sup>1</sup> This is the ninth of a series of reports on a study conducted by the Committee on Social and Psychological Factors Affecting Fertility, sponsored by the Milbank Memorial Fund with grants from the Carnegie Corporation of New York. The Committee consists of Lowell J. Reed, Chairman; Daniel Katz; E. Lowell Kelly; Clyde V. Kiser; Frank Lorimer; Frank W. Notestein; Frederick Osborn; S. A. Switzer; Warren S. Thompson; and P. K. Whelpton.

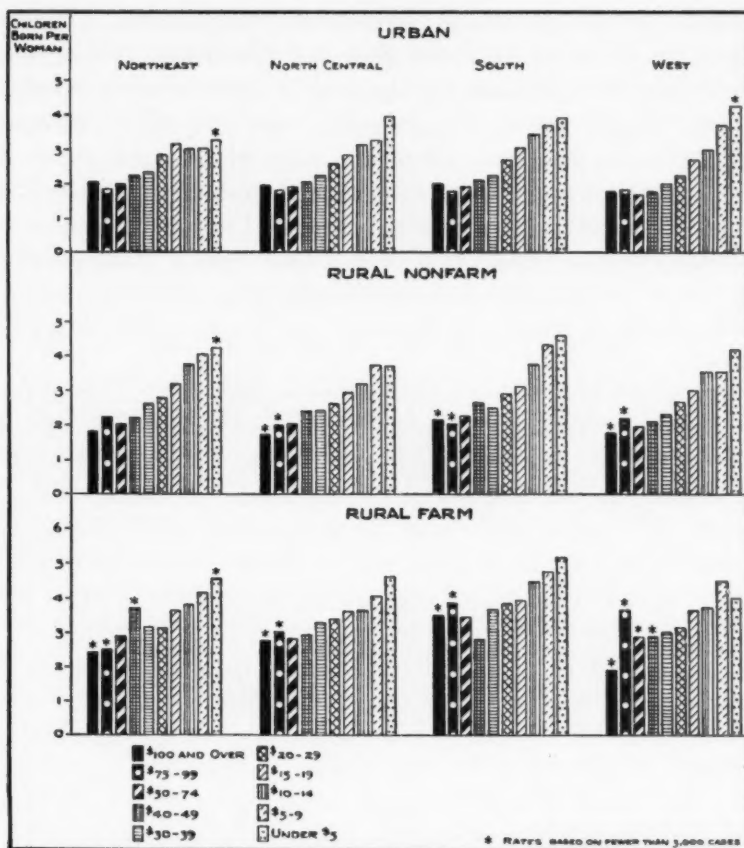


Fig. 1. Average number of children born per ever-married native-white woman 45-49 years of age, by monthly rental value of the home, and by region and type of community, United States, 1940. (Data computed from U. S. Bureau of the Census: POPULATION—DIFFERENTIAL FERTILITY 1940 AND 1910—WOMEN BY NUMBER OF CHILDREN EVER BORN. Washington, Government Printing Office, 1945, pp. 386-400.)

most rental classes but the second-highest and even third-highest rental classes exhibit the lowest fertility rates.<sup>2</sup>

<sup>2</sup> Selective factors might help to account for the reversal of the relationship if amount of rent is used as the criterion of socio-economic status. Large families need more room and hence might find themselves in higher rental classes than small families of comparable economic status. However, the failure of the inverse relation of fertility to socio-economic status to extend throughout the "upper" classes is also found when fertility rates are presented by such variables as educational and occupational attainment.

As to the first part of the hypothesis stated above, it is true that data collected by Pearl, Stix and Notestein, Beebe,<sup>3</sup> and others have already shown in the main a direct relation between socio-economic status and the prevalence and effectiveness of contraceptive practice. However, since those data relate to rather specialized groups (such as maternity patients in hospitals, clients of birth control clinics, and residents of a rural coal-mining area) and not to as representative a group as that studied in Indianapolis, it seemed unwise to omit the hypothesis in the Study of Social and Psychological Factors Affecting Fertility.

In broad terms, the Study may be regarded as a logical follow-up of the studies of contraception mentioned above. These studies gave rather clinching evidence that the inverse relation of fertility to socio-economic status could be accounted for largely by class differences in the prevalence and effectiveness of contraception. In undermining the theory, then held in some quarters, that class differences in fertility connoted class differences in innate reproductive capacity, they indicated that future research on group differences in fertility belonged to the field of social science rather than to medicine or biology.<sup>4</sup> In other words, the studies of contraception constituted a highly important first step, but it was realized that contraception was only the means of implementing desires for family limitation and that there still remained the necessity of studying the underlying cultural and personal factors affecting the resort to contraception and decisions regarding family size.

The previously described trends of class differences in fertility themselves emphasize the inadequacy of interpretations made simply in terms of differential contraceptive practice.

<sup>3</sup> Pearl, Raymond: *THE NATURAL HISTORY OF POPULATION*. New York, The Oxford University Press, 1939.

Stix, Regine K. and Notestein, Frank W.: *CONTROLLED FERTILITY*. Baltimore, The Williams and Wilkins Company, 1940.

Beebe, Gilbert W.: *CONTRACEPTION AND FERTILITY IN THE SOUTHERN APPALACHIANS*. Baltimore, The Williams and Wilkins Company, 1942.

<sup>4</sup> It should be emphasized, however, that much work remains to be done in the field of physiological aspects of fertility and that this field is highly important in its own right.



*A priori*, a leveling off of fertility rates in the "upper" socio-economic classes might be interpreted simply in terms of the uniform extent of contraceptive practice. This mechanistic interpretation is obviously inadequate, for in the "upper" classes there are frequent instances of a direct relation between fertility and socio-economic status. Furthermore, the studies like those mentioned give no indication of the relation between socio-economic status and fertility among couples classified according to success in planning their families.

#### PURPOSE AND SCOPE OF PRESENT STUDY

In accordance with the previously stated hypothesis, the chief purposes of this paper are to consider on the basis of the Indianapolis Study materials (1) the relation of fertility planning to socio-economic class, and (2) the relation of fertility to socio-economic status within specific fertility-planning groups. Both of these analyses involve fertility-planning classifications and are restricted to the 1,444 "relatively fecund" couples in the inflated or adjusted sample. However, certain socio-economic classifications are available for the 533 "relatively sterile" couples in the inflated sample. Hence, in addition to the major objectives mentioned above, it will also be possible to examine briefly (1) the relation of fecundity status to socio-economic class, and (2) fertility rates by socio-economic and fecundity status. The three basic classifications used in this analysis, those by fecundity, fertility-planning, and socio-economic status are described in subsequent sections of this report.

#### THE GROUP STUDIED

Descriptions of the group studied and of the general scope and nature of the data collected in the Study of Social Psychological Factors Affecting Fertility have been presented in previous articles of the present series.<sup>5</sup>

<sup>5</sup> Whelpton, P. K. and Kiser, Clyde V.: *Social and Psychological Factors Affecting Fertility*.

I. Differential Fertility Among 41,498 Native-White Couples in Indianapolis. *The Milbank Memorial Fund Quarterly*, July, 1943, xxi, No. 3, pp. 221-280 (Reprint pp. 1-60).

(Continued on page 192)

Briefly stated, short schedules were filled out for 41,498 native-white couples with wife under 45 in a Household Survey of Indianapolis. The Intensive Study was restricted to 2,589 native-white Protestant couples whose marriages were contracted during 1927-1929, and were unbroken at the time of the interview in 1941. Additional requirements for inclusion were: the wife was under 30 and the husband under 40 at marriage, neither had been previously married, the couple had resided in a large city most of the time since marriage, and both husband and wife had at least completed grammar school.

At the conclusion of the field work long schedules had been completed for 860 "relatively fecund" couples and briefer ones for 220 "relatively sterile" couples, a total of 1,080. The adjusted or "inflated" sample consists of 1,444 "relatively fecund" and 533 "relatively sterile" couples, a total of 1,977. Couples refusing to cooperate in the Study comprise about 11 per cent of those contacted. Despite their absence, the inflated sample is quite similar to the original universe of 2,589 eligible couples not only with respect to the distribution by number of live births but also with respect to such distributions as dwelling units by rental value and husbands and wives by age and educational attainment.

*General Fertility of the Group.* Table 1 and Figure 2 point up the basic similarity of fertility rates among couples in the inflated sample and in the original universe of eligible couples. The rates given are specific with reference to wife's age and age at marriage in order to afford comparisons with two larger universes, the native-white once-married couples in Indianapolis and comparable couples in all cities in the United States of 250,000 population and over.<sup>6</sup> It will be noted that within

IV. Developing the Schedules, and Choosing the Type of Couples and the Area to be Studied. *The Milbank Memorial Fund Quarterly*, October, 1945, xxiii, No. 4, pp. 386-409 (Reprint pp. 139-162).

V. The Sampling Plan, Selection, and the Representativeness of Couples in the Inflated Sample. *The Milbank Memorial Fund Quarterly*, January, 1946, xxiv, No. 1, pp. 49-93 (Reprint pp. 163-208).

<sup>6</sup> The data for all cities are from U. S. Bureau of the Census: POPULATION: DIFFERENTIAL FERTILITY 1940 AND 1910; WOMEN BY NUMBER OF CHILDREN EVER BORN. Washington, U. S. Government Printing Office, 1945, pp. 51-52.

groups of given age and age at marriage, the fertility rates for wives in Indianapolis were in most instances about the same as those for wives in all cities of 250,000 and over. Generally lower rates were found for the original universe of eligible couples and for the inflated sample. The average fertility of couples in the inflated sample was about 15 per cent below that for couples in all cities of 250,000 population and over. This reflects the fertility-depressing effect of the qualifications for eligibility, particularly those concerning religion and education. The broad implication of Figure 2, however, is that fertility rates among

Table 1. Fertility rates by age and age at marriage. Native-white once-married women (husband present) in (a) cities of 250,000 population and over; (b) the Indianapolis Household Survey; (c) the group of couples eligible for the Study; and (d) the total inflated sample.

AGE OF WIFE		NUMBER OF WIVES				CHILDREN EVER BORN PER 100 WIVES			
		1940 Census	Indianapolis			1940 Cen- sus	Indianapolis		
At Marriage	At Interview <sup>a</sup>	Cities 250,000 +	Household Survey	Couples Eligible for Study	Total Inflated Sample	Cities 250,000 +	Household Survey	Couples Eligible for Study	Total Inflated Sample
Under 18	25-29	47,660	1,395	251	218	232	229	226	205
Under 18	30-34	46,300	1,425	203	155	282	273	233	243
18-19	30-34	95,560	1,667	594	500	219	211	180	178
20-21	30-34	127,040	1,574	494	381	175	169	167	170
20-21	35-39	101,240	1,530	95	60	210	195	146	140
22-24	30-34	136,700	1,948	96	70	137	127	140	127
22-24	35-39	114,980	1,526	509	381	174	162	138	140
25-26	35-39	57,160	640	163	121	132	133	123	125
25-26	40-44	47,620	525	35	20	162	158	129	145
27-29	40-44	33,600	439	128	62	142	117	81	73

<sup>a</sup> Because all of the couples "Eligible for Study" and in the "Total Inflated Sample" were married in 1927, 1928, or 1929, "Age of Wife at Interview" for those groups is restricted as follows: line 1, 27.29 to 29.99 years (assuming no marriages before age 16); line 2, 30.00 to 33.08 years; line 4, 31.29 to 34.99 years; line 5, 35.00 to 37.08 years; line 6, 33.29 to 34.99 years; line 8, 36.29 to 39.99 years; and line 9, 40.00 to 42.08 years.



Fig. 2. Fertility rates by age and age at marriage. Native-white wives in unbroken first marriages in (a) cities of 250,000 population and over; (b) the Indianapolis Household Survey; (c) the group of couples eligible for the Study; and (d) the total inflated sample (see Table 1).

couples in the inflated sample probably are not "out of line"

with the averages that one might expect among couples meeting the same qualifications in all United States cities of 250,000 and over.

*Effect of Eligibility Restrictions on Class Differences in Fertility.* Since the present paper is concerned in large part with socio-economic differences in fertility, it is pertinent to consider the effect of the "fertility-depressing" eligibility restrictions on class differences in fertility. As previously noted, the Intensive Study was not only restricted to urban Protestant couples who had spent most of their married life in cities but also to those in which both husband and wife had completed at least the eighth grade. The omission of couples of less educational attainment would be expected to narrow the range of variations in fertility

Table 2. Relative variations in fertility by rental status among (1) all couples with wife 40-44 in the Household Survey; (2) "Both Protestant" couples with wife 40-44 in the Household Survey; (3) all couples in the inflated sample; and (4) "relatively fecund" couples in the inflated sample. All data are restricted to native-white once-married couples.

MONTHLY RENT PAID BY COUPLE OR RENTAL VALUE OF HOME	FERTILITY RATES (Children Ever Born Per 100 Couples)				RELATIVE VARIATIONS (Base Rate = 100)			
	Household Survey (Wives 40-44)		Intensive Study (Inflated Sample)		Household Survey (Wives 40-44)		Intensive Study (Inflated Sample)	
	All Couples	"Both Protestant"	All Couples	"Relatively Fecund"	All Couples	"Both Protestant"	All Couples	"Relatively Fecund"
\$60+	160	154	152	167	71	70	90	83
50-59	152	144	145	173	68	66	86	86
40-49	166	154	140	176	74	70	83	88
35-39	192	181	143	166	85	83	85	83
30-34	222	211	150	173	99	96	89	86
25-29	231	220	172	203	103	100	102	101
20-24	283	282	202	238	126	129	120	118
15-19	353	352	218	265	157	161	129	132
Under 15	372	388	252	323	165	177	149	161
Base Rate <sup>1</sup>	225	219	169	201	100	100	100	100
Number of Couples	6,551	5,283	1,977	1,444				

<sup>1</sup>The "base rate" for each group represents the average fertility rate weighted according to the rental distribution of the "Both Protestant" couples.

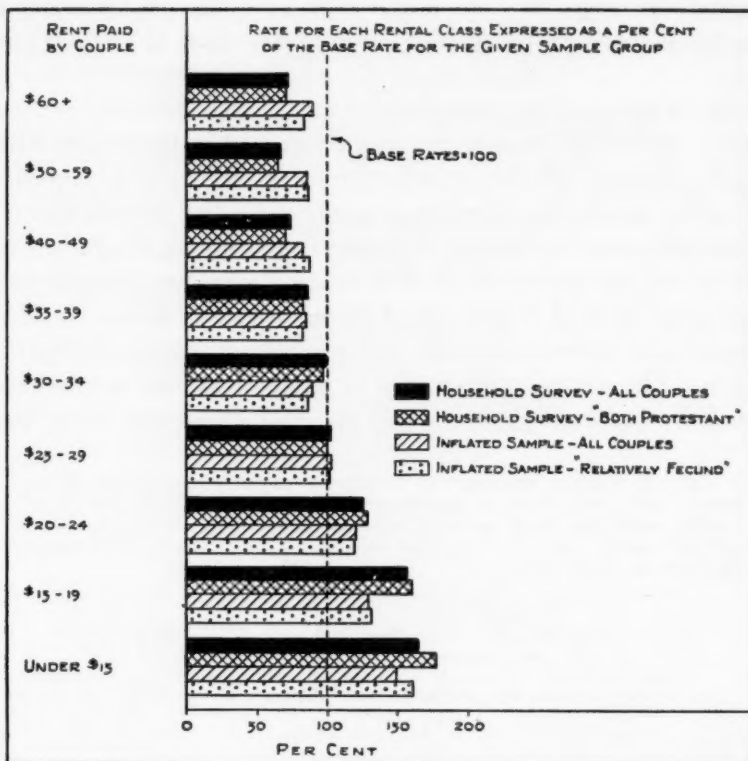


Fig. 3. Relative variations in fertility rates by rental status among (1) all couples with wife 40-44 in the Household Survey; (2) "Both Protestant" couples with wife 40-44 in the Household Survey; (3) all couples in the inflated sample; and (4) "relatively fecund" couples in the inflated sample. All data restricted to native-white once-married couples (see Table 2).

not only *ipso facto* by educational attainment but also by all other criteria of socio-economic status. For instance, although no restriction was made by rental status itself, the couples of low rental status are restricted to those completing eighth grade and would be expected to exhibit lower fertility rates than those of similar rental status but lower educational attainment. Since the chief analyses in this and subsequent reports are also restricted to "relatively fecund" couples, it is of interest to consider the bearing of this additional restriction on class differences in fertility.



Considerable light on the foregoing problems is afforded by Table 2 and Figure 3, which present fertility rates and the relative variations of these rates by monthly rent for four successively smaller groups of native-white couples: (1) the 6,551 with wife 40-44 in the Household Survey; (2) the 5,283 Protestant couples with wife 40-44 in the Household Survey; (3) the 1,977 in the inflated sample; and (4) the 1,444 "relatively fecund" couples in the inflated sample. The fertility rates for groups (1) and (2), of course, are not strictly comparable with those for groups (3) and (4), since the former relate to wives 40-44 years of age regardless of duration of marriage, whereas the latter, by virtue of the eligibility restrictions, relate to couples married 12-15 years and in which wives could be 26-44 years of age at interview but were mainly 30-39. However, our interest here is in a comparison of the four groups with respect to the internal relative spread of fertility rates by rental status.<sup>7</sup> For this purpose the fertility rate for each rental class of a given group is expressed as a percentage of the base rate for the total group.<sup>8</sup>

In the first place, a comparison of groups (1) and (2) indicates that although the restriction to "Both Protestant" couples lowers the average fertility rate, it *increases* rather than diminishes the relative spread of the rates (*see* Figure 3). Thus among couples of all religions in the Household Survey the fertility rate for the "\$50-\$59" class is about 32 per cent lower than the "adjusted average" or "base rate" for this group, and the fertility rate for the "Under \$15" group is about 65 per cent higher than the base rate. Among the "Both Protestant" couples the range extends from 34 per cent below the base rate to 77 per cent above the base rate.

The chief reason for the situation described above was dis-

<sup>7</sup> There are slight differences in the rental data used for the several groups. In all cases the data refer to rent paid by the couple, which is smaller than the rental value of the dwelling unit if the dwelling unit is shared. In the case of the "relatively fecund" couples, however, the rental data refer to "shelter rent paid by couple" which excludes amounts paid for utilities (heat, electricity, water) and furniture.

<sup>8</sup> The "base rates" are the average rates for each group standardized according to the rental distribution of group (2), i.e., the "Both Protestant" couples with wife 40-44 in the Household Survey.

cussed in a previous article. It was shown that "the interclass differences are more pronounced and the internal range of relative variations in fertility rates is wider in the Protestant than in the Catholic group."<sup>9</sup> This was interpreted as signifying a lower degree of relationship between economic status and the practice of contraception among the Catholic than among the Protestant couples. In this connection it is also relevant to point out that couples other than "Both Protestant" comprised only about 19 per cent of the total native-white couples with wife 40-44 in the Indianapolis Household Survey and that over half of these were "Both Catholic" couples and most of the remainder "Protestant-Catholic." Also, although the single restriction to Protestant couples does not materially alter the distribution by rental status, it is of interest to note that the average rental status of the "Both Catholic" couples is somewhat higher than that of the "Both Protestant" couples.<sup>10</sup>

The bearing of the additional restrictions for eligibility on the interclass differences in fertility may be judged by comparing the relative variations in fertility by rent for the "Both Protestant" Household Survey couples with those for the total inflated sample. It will be noted that the relative spread of the rates by rental status is notably wider for the former group than for the latter. Thus, whereas the lowest and highest rates for the former group are, respectively, 34 per cent below and 77 per cent above the base rate, the corresponding deviations in the latter group are only 17 and 49 per cent.

Finally, however, it will be noted that the restriction of the inflated sample to "relatively fecund" couples operates in the opposite direction and offsets in some measure the effects of the restriction by educational attainment. Whereas the fertility rates by rental status in the total inflated sample extend from 17 per cent below to 49 per cent above the base rate, among the

<sup>9</sup> Whelpton, P. K. and Kiser, Clyde V.: Social and Psychological Factors Affecting Fertility. I. Differential Fertility Among 41,498 Native-White Couples in Indianapolis. *The Milbank Memorial Fund Quarterly*, July, 1943, xxi, No. 3, p. 242 (Reprint p. 22).

<sup>10</sup> *Ibid.*, pp. 231 and 238 (Reprint pp. 11 and 18).

"relatively fecund" couples alone they extend from 17 per cent below to 61 per cent above the base rate. This enhancement of the interclass differences in fertility is due to the exclusion of "relatively sterile" couples among whom, as will be noted later, class differences in fertility are of small consequence.

#### FECUNDITY AND SOCIO-ECONOMIC STATUS

As previously noted, the studies of contraception carried out during the past fifteen years provide indirect but rather convincing evidence of the absence of any substantial differences in reproductive capacity by socio-economic status.<sup>11</sup> Also, a previous article in this series has indicated that whereas the several fertility-planning groups of the "relatively fecund" couples differed widely in fertility, the average "fecundity of the women concerned was approximately the same in one fertility-planning group as in another . . ." This conclusion was derived from the similarity of pregnancy rates during periods when contraception was not practiced.<sup>12</sup>

The analysis just mentioned was based upon classifications by fertility-planning status and relates only inferentially to the relation between socio-economic status and fecundity. Furthermore, its value for the latter purpose is limited by its restriction to couples already classified as "relatively fecund." More direct and comprehensive data on the relation of fecundity to socio-economic status are afforded by comparing the proportions of "relatively fecund" and "relatively sterile" couples in the various socio-economic groups.

*Classification by Fecundity Status.* All couples reporting four or more live births were classified as "relatively fecund" regardless of other circumstances. Couples with three or fewer live births were classified as "relatively fecund" unless they knew or had good reasons for believing that conception was physiologically impossible during a period of at least 24 or 36

<sup>11</sup> See references in footnote 3 above.

<sup>12</sup> Whelpton, P. K. and Kiser, Clyde V.: *Social and Psychological Factors Affecting Fertility*. VI. The Planning of Fertility. The Milbank Memorial Fund *Quarterly*, January, 1947, xxv, No. 1, p. 103 (Reprint p. 249).

Table 3. Proportion of couples "Relatively Fecund" and "Relatively Sterile" in the original and adjusted classifications by various measures of socio-economic status.

MEASURE OF SOCIO-ECONOMIC STATUS	EXISTING CLASSIFICATION					EXPERIMENTAL RECLASSIFICATION <sup>1</sup>				
	Number of Couples		Per Cent			Number of Couples		Per Cent		
	Total	"Relatively Fecund"	"Relatively Sterile"	"Relatively Fecund"	Total	"Relatively Fecund"	"Relatively Sterile"	Fecundity Not Impaired	Fecundity Impaired	Per Cent
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
ALL COUPLES	1,977	1,444	533	73.0	27.0	10.2	1,508	469	76.3	23.7
Average Annual Earnings of Husband (Last Period) <sup>2</sup>										
\$3,000+	282	213	69	75.5	24.5	10.6	218	64	77.3	22.7
2,000-2,999	544	380	164	69.9	30.1	10.7	411	133	75.6	24.4
1,000-1,999	460	341	119	74.1	25.9	9.8	347	113	75.4	24.6
1,200-1,599	489	366	123	74.8	25.2	9.8	388	101	79.3	20.7
Under 1,200	195	142	53	72.8	27.2	10.3	142	53	72.8	27.2
Monthly Rent, or Rental Value at Interview <sup>3</sup>										
\$50+	367	266	101	72.5	27.5	11.2	281	86	76.6	23.4
35-49	512	367	145	71.7	28.3	11.7	390	122	76.2	23.8
25-34	515	389	126	75.5	24.5	8.3	402	113	78.1	21.9
15-24	450	328	122	72.9	27.1	9.6	336	114	74.7	25.3
Under 15	129	90	39	69.8	30.2	10.9	95	34	73.6	26.4

<i>Husband's Occupations</i>		209	153	56	73.2	26.8	11.0	157	52	75.1	24.9
Professional		267	180	77	71.2	28.8	15.7	204	63	76.4	23.6
Proprietary		472	357	115	75.6	24.4	7.6	381	91	80.7	19.3
Clerical		398	298	100	74.9	25.1	8.8	300	98	75.4	24.6
Skilled		522	375	147	71.8	28.2	9.4	391	131	74.9	25.1
Semi-skilled											
<i>Education of Husband</i>		467	334	133	71.5	28.5	10.5	352	115	75.4	24.6
College 1+		480	315	115	73.3	26.7	10.7	326	104	75.8	24.2
High School 4		163	118	45	72.4	27.6	11.7	130	33	79.8	20.2
High School 3		270	205	65	75.9	24.1	8.5	210	60	77.8	22.2
High School 2		173	134	39	77.5	22.5	8.7	137	36	79.2	20.8
High School 1		455	319	136	70.1	29.9	10.8	334	121	73.4	26.6
Grade School 8											
<i>Education of Wife</i>		322	239	83	74.2	25.8	8.7	248	74	77.0	23.0
College 1+		678	489	189	72.1	27.9	11.7	520	158	76.7	23.3
High School 4		163	119	44	73.0	27.0	14.7	120	43	73.6	26.4
High School 3		307	231	76	75.2	24.8	8.1	238	69	77.5	22.5
High School 2		187	142	45	75.9	24.1	7.0	146	41	78.1	21.9
High School 1		314	218	96	69.4	30.6	10.2	232	82	73.9	26.1
Grade School 8											
<i>Chapin's Social Status Scale</i>		282	206	76	73.0	27.0	8.9	221	61	78.4	21.6
175+		292	211	81	72.3	27.7	13.4	219	73	75.0	25.0
150-174		371	255	116	68.7	31.3	12.4	267	104	72.0	28.0
125-149		424	315	109	74.3	25.7	7.5	325	99	76.7	23.3
100-124		352	247	105	70.2	29.8	12.5	265	87	75.3	24.7
75-99		256	210	46	82.0	18.0	5.9	211	45	82.4	17.6
Under 75											

<sup>1</sup> For a description of the experimental reclassification see text in section entitled Classification by Fecundity Status.  
<sup>2</sup> See text for a description of slight differences between the "relatively fecund" and "relatively sterile" couples with respect to classifications by husband's earnings, rental status, and husband's occupation.

consecutive months since marriage (24 for never-pregnant couples, 36 for others). Failure to conceive when contraception was not practiced "always" or "usually" during periods of the above durations was considered good reason for such belief. Couples not classified as "relatively fecund" were considered "relatively sterile."

It should be emphasized that the "relatively fecund-relatively sterile" classification was neither determined medically nor designed to conform strictly to medical concepts of fecundity and sterility. The "relatively fecund" group contains a few couples (18) who were so classified *only* because they reported four or more live births. Among the 121 never-pregnant couples classified as "relatively fecund" there were doubtless a few (probably 11-13) who were really sterile but whose sterility was unknown to them because they had always practiced contraception. On the other hand, some of the couples classified as "relatively sterile" because they failed to conceive in the absence of regular or usual contraception practice during 24 or 36 consecutive months would not have been so classified on the basis of reasonable criteria of other types. Thus, because of the successful use of contraceptives (for periods of at least several months) and statements that additional children were not wanted, 82 (about 15 per cent) of the "relatively sterile" couples were coded as not having experienced actual reductions in number of pregnancies as a result of impaired fecundity.

In view of the above, Table 3 not only presents the existing "relatively fecund-relatively sterile" subdivisions by socio-economic status (Columns 3-6) but also includes two types of refinements. Column 7 shows the proportion of couples of given socio-economic status classified as "relatively sterile" and "never pregnant." Columns 8-11 present an experimental reclassification involving (a) the transfer from the "relatively fecund" to the "relatively sterile" group of the 18 couples originally classified as "relatively fecund" *only* because they had four or more live births, and (b) the transfer from the "relatively sterile" to the "relatively fecund" group of the 82 couples be-



lieved to have experienced no actual reduction in number of pregnancies despite their assignment to the "relatively sterile" category. As will be seen later, the existing classification and the experimental reclassification lead to the same conclusions with regard to the relation between fecundity and socio-economic status.

*Classification by Socio-Economic Status.* The measures of socio-economic status used in Table 3 are average annual earnings of the husband, monthly rental status, occupational class of the husband, educational attainment of the husband and wife, and rating on "Chapin's Social Status Scale." Data on these items were collected from all couples regardless of fecundity status. On the first three of these items the classifications of the "relatively sterile" couples are not strictly comparable with those of the "relatively fecund" couples. As indicated below, however, the differences are believed to be of little consequence in view of the broad categories used.

*Husband's Average Annual Earnings.* In this case the classification of "relatively fecund" couples is based upon detailed histories of husbands' earnings during the last third of the period since marriage (i.e., approximately four years preceding interview) whereas that for the "relatively sterile" couples is based upon replies to the single question: "Average annual earnings of the husband?"<sup>13</sup>

*Rental Status.* For "relatively fecund" couples living in rented quarters the coded data relate to the amount paid by the couple per month in 1941 for *shelter* rent, which was the total amount minus estimated allowances for any utilities (heat, electricity, water) and for furniture included in the rental.<sup>14</sup> The data for "relatively sterile" renters relate to total monthly

<sup>13</sup> There are reasons for believing that the answers to this question were unduly influenced by the earnings during the years immediately preceding the interview. In consequence, these data are compared with data for the "relatively fecund" couples relating to the last third of the period since marriage. Data relating to the total period of married life are presented for the "relatively fecund" couples in a later section.

<sup>14</sup> These adjustments were necessitated for only a small number of the "relatively fecund" couples and in most cases were for heat and water provided in rented apartments.

rental paid by the couple in 1941 regardless of whether the amount included utilities or furnishings. The monthly rental value of owned homes, however, was estimated in the same way for both groups, being based on the reported market value of the home at the time of the interview in 1941.

*Occupation of the Husband.* For the "relatively fecund" couples these data relate to the occupation held by the husband for the longest period of time since marriage. For the "relatively sterile" couples they relate to the husband's "usual" occupation.

*Educational Attainment of the Husband and Wife.* In all cases these data relate to the highest grade or year in school completed by the husband or wife.

*Rating of Household on Chapin's Social Status Scale.* The Scale is based upon two main groups of items: (1) "Material Equipment and Cultural Expression of the Living Room" and (2) "Conditions of Articles in Living Room."<sup>15</sup> It is administered by entering the appropriate plus or minus scores on the basis of observation of the living room, and questions regarding newspapers and magazines. The algebraic sum of these scores represents the general "social status" rating.<sup>16</sup>

*Fecundity Status by Socio-Economic Class.* As indicated in Table 3 there appears to be little relation of fecundity status to socio-economic class among couples in the Indianapolis Study. The proportions of couples originally classified as "relatively fecund" or "relatively sterile" tend to remain much the same in the various breakdowns by income, rent, occupation, education, and Chapin's Social Status Scale (Columns 5-6). The most marked deviation from the general average of the 73 per cent of the couples classified as "relatively fecund" (and the 27 per cent classified as "relatively sterile") occurs among the couples ranking under 75 on Chapin's Social Status Scale. Of the 256 couples in this category, 82 per cent were "relatively fecund"

<sup>15</sup> The scale was developed by Professor F. Stuart Chapin of the University of Minnesota on the basis of a large amount of empirical research. A copy is included in the Appendix of this article.

<sup>16</sup> As may be judged from the Scale, the total score is rather strongly influenced by number of newspapers and periodicals.

and 18 per cent "relatively sterile" according to the original classification. This type of exception persists in the other columns of Table 3 and is probably due partly to selective factors. Couples with several children in the home are more likely than others (of similar economic status) to be penalized on Chapin's Scale by the disarray of articles in the room and also by the sheer election to have children rather than expensive furnishings and several newspapers and magazines.

There were 201 couples (10.2 per cent of the total) classified not only as "relatively sterile" but also as "never pregnant." The proportion that these couples constituted of the total in the various socio-economic classes is shown in Column 7 of Table 3. Although these percentages vary more widely than those in Column 6, they afford little evidence of a consistent relationship between socio-economic status and a high degree of sterility.

Finally, it will be noted that whereas the adjustments introduced in Columns 8-11 serve to change the proportion of couples in the "relatively fecund" and "relatively sterile" groups from 73 and 27 to 76 and 24 per cent, respectively, the results again attest to the lack of any important relation of fecundity to socio-economic status.

#### FERTILITY RATES BY SOCIO-ECONOMIC AND FECUNDITY STATUS

Table 4 presents fertility rates by socio-economic status for (a) the 1,977 couples in the total inflated sample, (b) the 1,444 "relatively fecund" couples, and (c) the 533 "relatively sterile" couples.<sup>17</sup> In Figure 4, these rates are respectively represented by (a) the combined length of the first two sections of each bar, (b) the total length of each bar, and (c) the first section of each bar. The population bases by socio-economic status are the same as those in Columns 1-4 in Table 3.

Attention may first be given to the class differences in fertility

<sup>17</sup> The index of fertility, number of live births per 100 couples, is used without further standardization since the restriction to couples married during 1927-1929 (with wife under 30 and husband under 40 at marriage) affords a fairly uniform (12-14 years) duration of marriage among the couples in the Study. The few cases of adopted children (11 among 10 "relatively fecund" couples and 12 among 9 "relatively sterile" couples) are considered as live births in this report.

Table 4. Number of children ever born per 100 couples in the inflated sample, by fecundity status and by husband's average annual earnings, rental status, husband's occupation, rating on Chapin's Social Status Scale, and educational attainment of husband and wife.

CHILDREN EVER BORN PER 100 COUPLES							
Class	Total	"Relatively Fecund"	"Relatively Sterile"	Class	Total	"Relatively Fecund"	"Relatively Sterile"
Total	171	203	84	Total	171	203	84
BY HUSBAND'S EARNINGS				BY SHELTER RENT			
\$3,000+	159	180	94	\$50+	149	170	94
2,000-2,999	149	176	87	35-49	142	170	70
1,600-1,999	163	194	76	25-34	162	189	78
1,200-1,599	189	229	70	15-24	210	252	99
Under 1,200	227	266	121	Under 15	252	323	87
BY HUSBAND'S OCCUPATION				BY CHAPIN'S SOCIAL STATUS SCALE			
Professional	140	164	73	175+	152	171	101
Proprietary	155	191	68	150-174	127	157	51
Clerical	152	168	103	125-149	142	173	75
Skilled	194	226	101	100-124	166	192	93
Semiskilled	182	225	71	75-99	195	240	90
Unskilled	303	310	*	Under 75	257	290	104
BY EDUCATION OF HUSBAND				BY EDUCATION OF WIFE			
College 1+	149	172	89	College 1+	151	169	98
High School 4	157	188	75	High School 4	153	184	71
High School 3	175	205	98	High School 3	161	193	73
High School 2	197	232	88	High School 2	195	229	91
High School 1	171	199	74	High School 1	191	217	111
Grade School 8	185	228	84	Grade School 8	198	247	86
By Education of Couple							
FERTILITY RATES				NUMBER OF COUPLES <sup>1</sup>			
Both College	160	181	106	Both College	220	157	63
Wife College				Wife College			
(Husb. Lower)	131	146	70	(Husb. Lower)	102	82	20
Husband College				Husband College			
(Wife Lower)	139	165	74	(Wife Lower)	247	177	70
Both High School				Both High School			
3 or 4	153	188	68	3 or 4	353	250	103
Wife H. S. 3 or 4				Wife H. S. 3 or 4			
(Husb. Lower)	169	200	82	(Husb. Lower)	299	221	78
Husb. H. S. 3 or 4				Husb. H. S. 3 or 4			
(Wife Lower)	189	215	111	(Wife Lower)	175	131	44
Both Lower Than				Both Lower Than			
High School 3	202	245	86	High School 3	581	426	155

\* Rate not computed.

<sup>1</sup> The population bases for other rates in this table are given in Table 3.

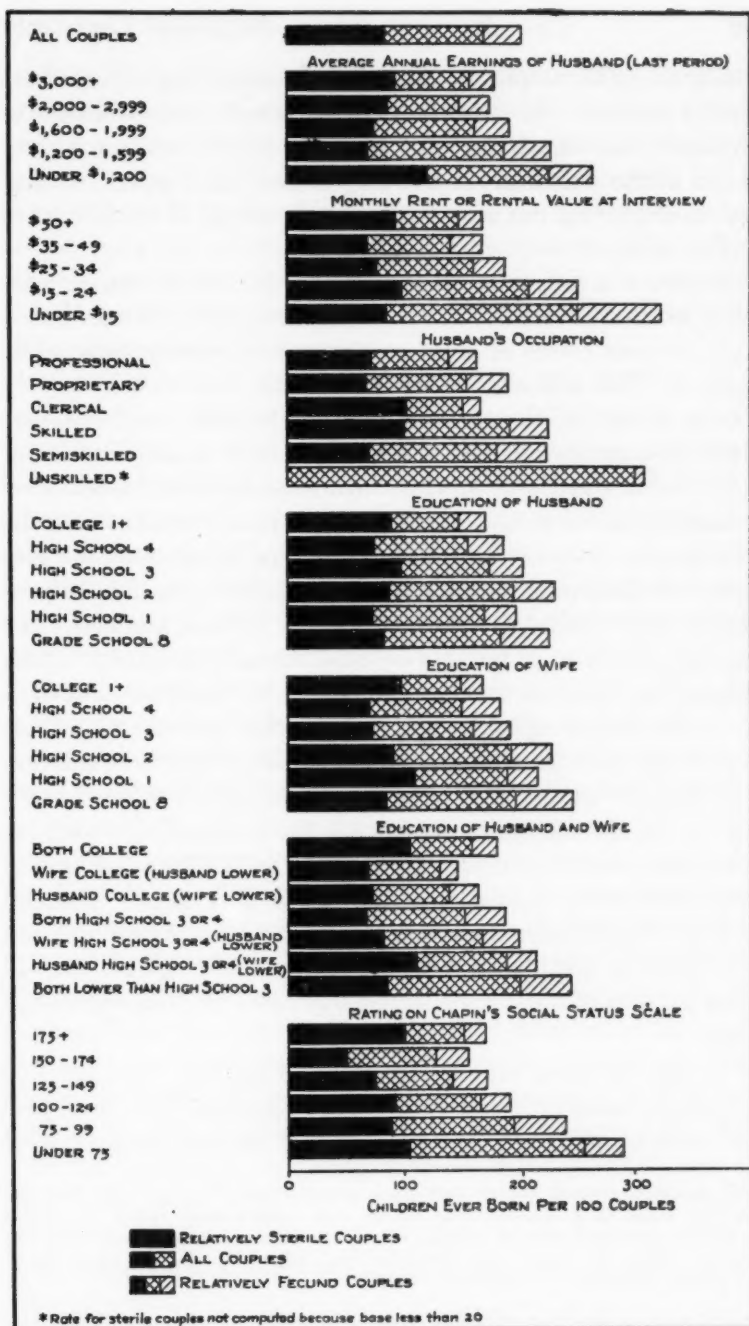


Fig. 4. Number of children ever born per 100 couples in the inflated sample, by fecundity status and by husband's average annual earnings, rental status, husband's occupation, rating on Chapin's Social Status Scale, and educational attainment of the husband and wife (see Table 4).

among all 1,977 couples in the inflated sample regardless of fecundity status. As already demonstrated, the exclusion of couples in which husbands and wives left school before the completion of the eighth grade not only lowers the average fertility level of the group but also decreases the range of variations in fertility along socio-economic lines.

Despite the influence of the eligibility restrictions, the familiar relation of fertility to socio-economic status is manifested in the various forms of socio-economic breakdown depicted in Figure 4. This is the tendency for fertility rates to be inversely associated with socio-economic rank below, but not above, certain socio-economic levels. Thus, the inverse association is apparent below the \$3,000 level by income and below the \$50 level by monthly rental value. In the occupational classification, the fertility rate is lower for the professional class than for any other, but there is little difference between the rates for the proprietary and clerical groups in the total inflated sample. The range of variations in fertility by educational attainment of the husband or wife is automatically reduced by the absence of data for couples below eighth grade. Above this level the classifications based upon the wife's schooling exhibit the inverse relation of fertility to educational attainment somewhat more sharply than do the classifications concerning the husband. In each instance, however, the average fertility of the "College 1-4" group is but little lower than that of the "H. S. 4" group.<sup>18</sup> Finally, the joint classification by educational status of the husband and wife, and the classification by Chapin's Scale exhibit the familiar pattern of variations in fertility rates by socio-economic status.

Perhaps the most striking feature of Figure 4 is the marked contrast between the "relatively sterile" and the "relatively fecund" couples with respect to levels and internal variations of

<sup>18</sup> It is also of interest to note that a subdivision of the "College 1-4" group reveals that husbands graduating from college were slightly more fertile than those completing only three years of college. Wives who were college graduates exhibited a higher fertility than those who completed high school but did not enter (or at least did not complete one year at) college.



fertility rates. The rates for the "relatively sterile" couples, represented by the first sections of the bars, exhibit little in the way of systematic variation by socio-economic status. Hence the rates for the "relatively fecund" couples, represented by the total lengths of the bars, vary more sharply by socio-economic status than the averages for the total group described above. The "relatively fecund" couples, constituting 73 per cent of the total, heavily influence the patterns of class differences in fertility among the total group.

Several points should be noted regarding the absence of systematic class differences in the fertility of "relatively sterile" couples. In the first place, of course, if the group were restricted to couples always completely sterile, no variations in fertility whatsoever could exist. Instead there would be the uniform fertility rate of zero. No such rigid restriction was made, but by definition the "relatively sterile" group includes no couples with as many as four live births and this delimits the possible magnitude of internal variations in fertility.

In the second place, although some chance for class variations in fertility among "relatively sterile" couples is afforded by the inclusion of couples with as many as three live births, perhaps there is no reason to suppose that the class differences in fertility of this group would follow the conventional pattern. Doubtless among some of these couples the practice of contraception during fecund periods of married life varied in the conventional manner by socio-economic status. Most of the couples, however, probably were confronted more by the problem of having pregnancies than with preventing them. It may well be that among these there tends to be a direct relation of socio-economic status to success in having one or two pregnancies, as is suggested in the comparisons based on earnings of husbands. Ability to secure medical care may be a factor in this case.

In the third place, it should be emphasized that owing to the small number of "relatively sterile" couples in some of the subdivisions by socio-economic status, some of the fertility rates are erratic simply as a result of chance variations.

In summary, although the eligibility restrictions tend to exclude couples with high fertility rates and hence to reduce variability within the sample, the further restriction to "relatively fecund" couples introduces compensations in both connections. The "relatively fecund" couples are not only more fertile than all couples in the inflated sample but their fertility is more closely associated with their socio-economic status. The effect of differences in fertility-planning status on this relationship is considered in the next two sections.

#### THE PLANNING OF FERTILITY IN RELATION TO THE SOCIO-ECONOMIC STATUS OF "RELATIVELY FECUND" COUPLES

*Classification by Fertility-Planning Status.* Since most of the hypotheses to be tested in the Indianapolis Study relate to families planned as to size, the classification by fertility-planning status is of basic importance. In fact, in order to insure adequate representation of families planned as to size, provision was made in the field work not only for the classification of couples by fecundity status but also for a preliminary subdivision of the "relatively fecund" couples into two broad groups—"size of family planned" and "size of family quasi-planned or too large."

Since the final classification of "relatively fecund" couples by success in the planning of fertility has been described in previous articles,<sup>19</sup> only a brief explanation of the criteria and categories is given here. In general, the detailed pregnancy and contraceptive histories, including data on outcome of pregnancies and attitudes toward each pregnancy, constitute the criteria for the classifications by planning status. The cate-

<sup>19</sup> Whelpton, P. K. and Kiser, Clyde V.: Social and Psychological Factors Affecting Fertility. VI. The Planning of Fertility. *The Milbank Memorial Fund Quarterly*, January, 1947, xxv, No. 1, pp. 63-111 (Reprint pp. 209-257).

Reed, Robert B.: Social and Psychological Factors Affecting Fertility. VII. The Interrelationship of Marital Adjustment, Fertility Control, and Size of Family. *The Milbank Memorial Fund Quarterly*, October, 1947, xxv, No. 3, pp. 383-425 (Reprint pp. 259-301).

Kiser, Clyde V. and Whelpton, P. K.: Progress Report on the Study of Social and Psychological Factors Affecting Fertility. *The Milbank Memorial Fund Quarterly*, April, 1947, xii, No. 2, pp. 175-186.

gories used, in descending degree of success in planning family size, are described below.<sup>20</sup>

*Number and Spacing of Pregnancies Planned.* The 403 couples in this group exhibit the most complete planning of fertility in that they had no pregnancies that were not deliberately planned by stopping contraception in order to conceive. The group consists of two major subdivisions: (a) 121 couples practicing contraception regularly and continuously and having no pregnancy, and (b) 282 couples whose every pregnancy was deliberately planned by interrupting contraception in order to conceive.

*Number Planned.* This group of 205 couples consists mainly of those whose last pregnancy was deliberately planned by stopping contraception in order to conceive but who had one or more previous pregnancies under other circumstances. Because of this, the couples are regarded as having planned the number but not the spacing of their pregnancies.

For couples not classified as "number and spacing planned" or as "number planned" the previously mentioned criteria regarding attitudes of husband and wife to each pregnancy constituted the bases for classification.

*Quasi-Planned.* This group includes 454 couples who did not deliberately plan the last pregnancy in the manner described above but who either wanted the last pregnancy or wanted another pregnancy.

*Excess Fertility.* This group is composed of 382 couples classified as least successful in planning size of family because they neither wanted the last pregnancy nor another.<sup>21</sup>

<sup>20</sup> In this brief description no attention is given to the few border-line and exceptional cases requiring more or less arbitrary classification. For description of such cases see the first reference listed in footnote 19 above.

<sup>21</sup> Although consolidated for present purposes, the "excess fertility" couples are distributed as follows by average number of excess pregnancies. (The average number of excess pregnancies for a couple is the total number after the last wanted by the husband plus the total number after the last wanted by the wife, divided by 2.)

<i>Excess Pregnancies</i>	<i>Number Couples</i>
$\frac{1}{2}$ , 1, or $1\frac{1}{2}$	280
2 or $2\frac{1}{2}$	51
3 or $3\frac{1}{2}$	39
4 or more	12

(Continued on page 212)

*Classifications by Socio-Economic Status.* In the previous section the classifications of "relatively fecund" couples by socio-economic status were restricted to those also available for the "relatively sterile" couples. In this section several additional classifications available only for "relatively fecund" couples are utilized. Among them is husband's average annual earnings since marriage, which is self-explanatory. The others are briefly described below.

*Net Worth.* This term, as in business and financial usage, relates to the difference between assets and liabilities. It is the sum of cash savings, market values of equities in real property, investments, business enterprises, and insurance policies, *minus* debts outstanding. Net worth was not asked as a single question but was computed on the basis of component data collected specifically for the purpose of such computation.

*Purchase Price of Car.* This classification is based on replies to the following question: "If you have a car now, what was its value when you bought it?" Persons owning more than one car were asked to give the actual purchase price of each, but such values were simply added in the coding of the data.<sup>22</sup>

*Age of Husband and Wife at Completion of Eighth Grade.* This question was asked of the husband and wife with the thought that it might afford differentiations more closely associated with intelligence than some of the other indices considered. Needless to say, there is no presumption here that age at completion of eighth grade is determined by intelligence alone. Educational opportunity, economic status, and local and home conditions of many types are frequently important considerations.

In his article cited in footnote 19, Reed subdivided the "number and spacing planned" group into three classes on the basis of degree of "positive control" of fertility, and presented distributions of each class by various measures of marital adjustment. An analogous procedure in the present article would be that of subdividing the group by number of live births and presenting distributions of each parity group by various measures of socio-economic status. The reverse procedure of presenting fertility rates by socio-economic status is the one followed in this analysis.

<sup>22</sup> Attention may be called to the fact that the husbands were also asked how much they would have to pay for the car they would like to own. Several questions of this type were asked in the hope of securing measures of differences between actual and desired levels of living. Data of this nature are to be considered in a later article.

*Index of Socio-Economic Status.* In view of the variety of classifications by socio-economic status used in this report, it seems appropriate to conclude the listing with a summary or average classification based upon the ratings of couples in all or most of the criteria previously considered.

After some experimentation and analysis of intercorrelations it was decided to use a summation of the ratings for the following eight items: husband's average annual earnings since marriage, net worth, shelter rent at interview, husband's longest occupational class since marriage, purchase price of car, education of husband, education of wife, and rating of the household on Chapin's Social Status Scale. Age at completion of eighth grade was omitted because its low correlation with the other items suggested that it has little importance as an indicator of socio-economic status.

In this connection it may be stated that much of the coding procedure of the Indianapolis data was planned under the assumption that the code numbers themselves would be added to obtain summary indices. The essential features of this plan were (1) ordering the code numbers in a uniform direction for items that might be combined, and (2) giving attention to the spacing of code numbers if fewer than ten categories were used in single-column coding.<sup>23</sup> The latter consideration is not pertinent to the socio-economic data considered here since the maximum numbers of categories in single-column coding generally were utilized. With reference to the first consideration, it would be more conventional for purposes of an index to have the code numbers rise with ascending socio-economic status. Actually, however, the reverse system was adopted in conformity with the decision to have code numbers relating to items pertinent to all hypotheses run in the direction of expected variations in fertility (i.e., high socio-economic status—low fertility—low code number; little liking for children—low fertility—low code number, etc.) This system makes it possible to combine directly

<sup>23</sup> Owing to certain exceptions to these two principles, conversion of certain code numbers into scores was necessary. These exceptions are described in Appendix II, which shows the scores applied to various categories of the eight items considered.



Table 5. The relation of fertility-planning status of "relatively fecund" couples to average annual earnings of the husband since marriage, monthly rent or rental value of the home, net worth of couple, occupation of husband, and purchase price of automobile.

MEASURE OF SOCIO-ECONOMIC STATUS	PER CENT DISTRIBUTION BY PLANNING STATUS <sup>1</sup>					PER CENT DISTRIBUTION BY SOCIO-ECONOMIC STATUS <sup>1</sup>				
	Total	No. and Spacing Planned	Number Planned	Quasi- Planned	Excess Fertility	Total	No. and Spacing Planned	Number Planned	Quasi- Planned	Excess Fertility
ALL COUPLES	100	27.9	14.2	31.4	26.5	100	100	100	100	100
<i>Husband's Annual Earnings</i>										
\$3,000+	100	45.5	16.5	23.1	14.9	8.4	13.7	9.8	6.2	4.7
2,000-2,999	100	33.0	14.7	35.1	17.2	19.8	23.4	20.5	22.0	12.8
1,600-1,999	100	30.1	14.0	35.3	20.6	19.8	21.4	19.5	22.2	15.4
1,200-1,599	100	25.6	15.2	29.8	29.4	33.3	30.6	35.6	31.5	36.9
Under 1,200	100	16.2	11.1	30.3	42.4	18.8	10.9	14.6	18.1	30.1
<i>Shelter Rent at Interview</i>										
\$50+	100	43.6	15.4	24.4	16.5	18.5	28.9	20.0	14.4	11.5
35-49	100	34.9	13.1	30.8	21.3	25.5	31.9	23.4	25.0	20.4
25-34	100	26.5	13.6	34.7	25.2	27.0	25.7	25.9	29.9	25.7
15-24	100	12.8	14.6	34.5	38.1	22.8	10.5	23.4	25.0	32.7
Under 15	100	13.3	16.7	28.9	41.1	6.2	3.0	7.3	5.8	9.7
<i>Net Worth</i>										
\$6,000+	100	49.5	19.9	20.9	9.7	14.3	25.4	20.0	9.5	5.2
4,000-5,999	100	45.6	18.4	20.2	15.8	7.9	12.9	10.2	5.1	4.7
2,000-3,999	100	30.2	12.8	32.4	24.6	19.5	21.1	17.6	20.1	18.1
1,000-1,999	100	22.2	9.4	37.4	31.0	14.1	11.2	9.3	16.8	16.5
200- 999	100	25.4	12.1	38.1	24.4	21.3	19.4	18.0	25.8	19.6
0- 199	100	12.2	16.0	32.5	39.2	16.4	7.2	18.5	17.0	24.3
Net Indebtedness	100	11.7	13.8	27.7	46.8	6.5	2.7	6.3	5.7	11.5
<i>Longest Occupation of Husband</i>										
Professional	100	42.5	11.1	32.7	13.7	10.6	16.2	8.3	11.0	5.5
Proprietary	100	34.7	20.5	26.8	17.9	13.2	16.4	19.0	11.2	8.9
Clerical	100	31.1	13.7	30.5	24.6	24.7	27.6	23.9	24.0	23.0
Skilled	100	27.5	10.7	32.9	28.9	20.7	20.4	15.6	21.6	22.5
Semiskilled	100	17.1	16.0	33.9	33.1	26.0	15.9	29.3	28.0	32.5
Unskilled	100	24.1	6.9	13.8	55.2	2.0	1.7	1.0	0.9	4.2
All Other	100					2.8	1.7	2.9	3.3	3.4
<i>Purchase Price of Present Car</i>										
\$1,050+	100	46.4	13.7	25.5	14.4	10.6	17.6	10.2	8.6	5.8
900-1,049	100	34.8	20.9	28.3	16.1	16.0	19.9	23.4	14.3	9.8
600- 599	100	38.7	11.0	30.8	19.5	25.3	35.0	19.5	24.7	18.7
300- 599	100	16.3	12.3	41.3	30.1	19.2	11.2	16.6	25.1	21.9
Under 300	100	14.7	15.2	27.7	42.4	12.8	6.7	13.7	11.2	20.6
Owens no Car	100	16.7	14.5	31.2	37.6	16.2	9.7	16.6	16.1	23.2

<sup>1</sup> For numerical distributions, see Figures 8-12.



the scores for items under different hypotheses. It is simply necessary in the present instance to keep in mind that a low index connotes a high socio-economic status and *vice versa*.

The summary classification itself is simply a broad grouping of the total scores received by individual couples. With the code numbers used, a couple could receive any score from one to seventy-two. The score of one would mean that couples were of topmost status in each of the eight classifications. The score of seventy-two would signify the lowest position in each of the eight classifications. The actual range of variation extended from one to sixty-nine.

*Fertility Planning by Socio-Economic Status.* As indicated in Tables 5-8 and Figures 5-7, the Indianapolis data definitely support the proposition that "the higher the socio-economic status, the higher the proportion of couples practicing contraception effectively . . . .", the first part of the hypothesis stated at the beginning of this paper. Within all ten of the topmost socio-economic classes listed in Tables 5, 6, and 8, 42-50 per cent of the couples are "number and spacing planned" and only 8-17 per cent are "excess fertility." Within most of the corresponding ten lowest-ranking socio-economic classes, in contrast, only 11-25 per cent of the couples are "number and spacing planned" and 36-55 per cent are "excess fertility."<sup>24</sup> The last-mentioned range is 33-47 per cent if the small group of unskilled laborers is disregarded.

In view of the wide and fairly consistent differences by socio-economic class in the proportions classified as being of highest or lowest planning status, it is not surprising that the proportions in the intermediate groups with reference to planning status do not vary much by socio-economic status.

Regardless of whether age at completion of eighth grade is considered as an index of socio-economic status or intelligence or both or neither, it is of interest to see that the proportion of

<sup>24</sup> The above ranges relate to all measures of socio-economic status presented except those in Table 7 concerning age at completion of eighth grade. Thus the classifications considered are those by husband's earnings, monthly rental status, net worth, husband's occupation, purchase price of car, education of husband and wife (separately and jointly), Chapin's Scale, and summary index of socio-economic status.

Table 6. The relation of fertility-planning status of "relatively fecund" couples to educational attainment of the husband and wife.

MEASURE OF SOCIO-ECONOMIC STATUS	PER CENT DISTRIBUTION BY PLANNING STATUS <sup>1</sup>					PER CENT DISTRIBUTION BY SOCIO-ECONOMIC STATUS <sup>2</sup>				
	Total	Number and Spacing Planned	Number Planned	Quasi- Planned	Excess Fertility	Total	Number and Spacing Planned	Number Planned	Quasi- Planned	Excess Fertility
ALL COUPLES	100	27.9	14.2	31.4	26.5	100	100	100	100	100
<i>Education of Husband</i>										
College 1 +	100	43.1	13.5	26.9	16.5	23.1	35.7	22.0	19.8	14.4
High school 4	100	27.6	16.5	36.8	19.0	21.8	21.6	25.4	25.5	15.7
High School 3	100	16.9	16.9	36.4	29.7	8.2	5.0	9.8	9.5	9.2
High School 2	100	20.0	16.1	32.7	31.2	14.2	10.2	16.1	14.8	16.8
High School 1	100	22.4	10.4	35.1	32.1	9.3	7.4	6.8	10.4	11.3
Grade School 8	100	24.8	11.9	27.6	35.7	22.1	19.6	18.5	19.4	29.8
Under Grade School 8	*	—	—	—	—	1.3	0.5	1.5	0.7	2.9
<i>Education of Wife</i>										
College 1 +	100	42.7	14.6	28.5	14.2	16.6	25.3	17.1	15.0	8.9
High school 4	100	31.9	10.8	36.2	21.1	33.9	38.7	25.9	39.0	27.0
High School 3	100	29.4	22.7	31.9	16.0	8.2	8.7	13.2	8.4	5.0
High School 2	100	15.2	12.6	31.6	40.7	16.0	8.7	14.1	16.1	24.6
High School 1	100	18.3	16.9	30.3	34.5	9.8	6.5	11.7	9.5	12.8
Grade School 8	100	22.5	17.0	23.9	36.7	15.1	12.2	18.0	11.5	20.9
Under Grade School 8	*	—	—	—	—	0.4	—	—	0.7	0.8
<i>Education of Couple</i>										
Both College	100	42.0	18.5	26.1	13.4	10.9	16.4	14.1	9.0	5.5
Wife College—Hus- band Lower	100	43.9	7.3	32.9	15.9	5.7	8.9	2.9	5.9	3.4
Husband College— Wife Lower	100	44.1	9.0	27.7	19.2	12.3	19.4	7.8	10.8	8.9
Both High School 3 or 4	100	25.2	13.6	42.8	18.4	17.3	15.6	16.6	23.6	12.0
Wife H. S. 3 or 4— Husb. Lower	100	26.7	17.2	33.9	22.2	15.3	14.6	18.5	16.5	12.8
Husb. H. S. 3 or 4— Wife Lower	100	13.0	24.4	29.8	32.8	9.1	4.2	15.6	8.6	11.3
Both Lower than H. S. 3	100	19.7	11.7	27.2	41.3	29.5	20.8	24.4	25.6	46.1

<sup>1</sup> For numerical distributions, see Figures 13-15.<sup>2</sup> Twenty-four couples are in the study despite the fact that the husband and/or wife technically failed to complete the usual eight grades of elementary school. These involve 19 men and 6 women (both husband and wife in one instance).

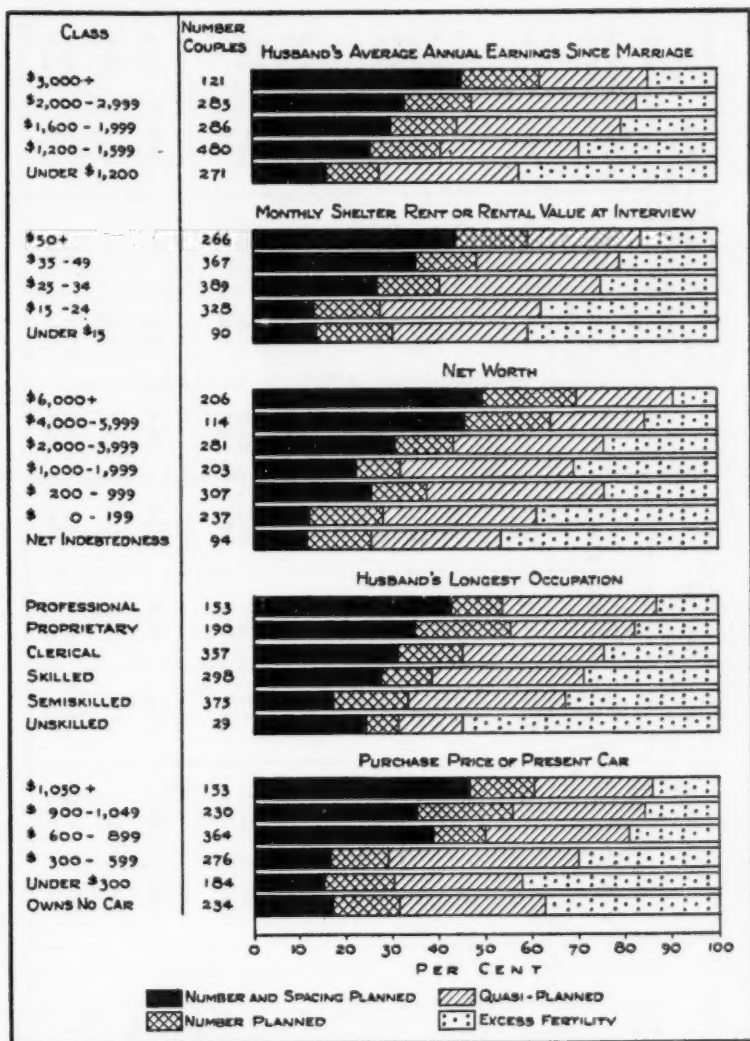


Fig. 5. Percentage distribution by fertility-planning status among "relatively fecund" couples subdivided by husband's average annual earnings since marriage, monthly shelter rent or rental value at interview, net worth, husband's longest occupation, and purchase price of present car (see Table 5).

couples classified as "number and spacing planned" does not vary much by this attribute. There is, however, a marked trend

Table 7. The relation of fertility-planning status of "relatively fecund" couples to age of husband and wife at completion of eighth grade.

MEASURE OF SOCIO-ECONOMIC STATUS	PER CENT DISTRIBUTION BY PLANNING STATUS <sup>1</sup>					PER CENT DISTRIBUTION BY SOCIO-ECONOMIC STATUS <sup>1</sup>				
	Total	Number and Spacing Planned	Number Planned	Quasi- Planned	Excess Fertility	Total	Number and Spacing Planned	Number Planned	Quasi- Planned	Excess Fertility
ALL COUPLES	100	27.9	14.2	31.4	26.5	100	100	100	100	100
Age Husband Com- pleted Eighth Grade										
Under 13	100	33.3	24.4	29.5	12.8	5.5	6.5	9.4	5.1	2.7
13	100	26.5	14.1	36.1	23.2	27.8	26.3	27.7	31.7	24.9
14	100	30.0	12.7	30.0	27.3	42.2	45.1	37.6	39.9	44.3
15	100	24.2	16.4	32.9	26.6	14.6	12.5	16.8	15.1	14.9
16 or Older	100	27.0	12.1	26.2	34.8	9.9	9.5	8.4	8.2	13.2
Age Wife Completed Eighth Grade										
Under 13	100	30.9	14.5	29.6	25.0	10.6	11.7	10.7	10.0	10.0
13	100	27.2	17.7	33.9	21.2	35.7	34.7	44.4	38.7	28.8
14	100	28.2	12.4	30.5	28.9	40.4	40.7	35.1	39.3	44.3
15	100	26.1	9.8	31.4	32.7	10.8	9.9	7.3	10.7	13.2
16 or Older	100	32.4	13.5	16.2	37.8	2.6	3.0	2.4	1.3	3.7
Age Couple Completed Eighth Grade										
Both Under 14	100	32.6	17.2	33.3	16.9	18.9	21.8	22.8	19.9	12.2
Wife Under 14 Husb. 14 or Older	100	25.2	17.0	32.6	25.2	27.5	24.6	32.7	28.4	26.6
Husb. Under 14 Wife 14 or Older	100	21.9	14.4	36.3	27.4	14.2	11.0	14.4	16.3	15.0
Both 14 or Older	100	32.4	13.5	16.2	37.8	39.5	42.6	30.2	35.3	46.2

<sup>1</sup> For numerical distributions, see Figures 16-18.

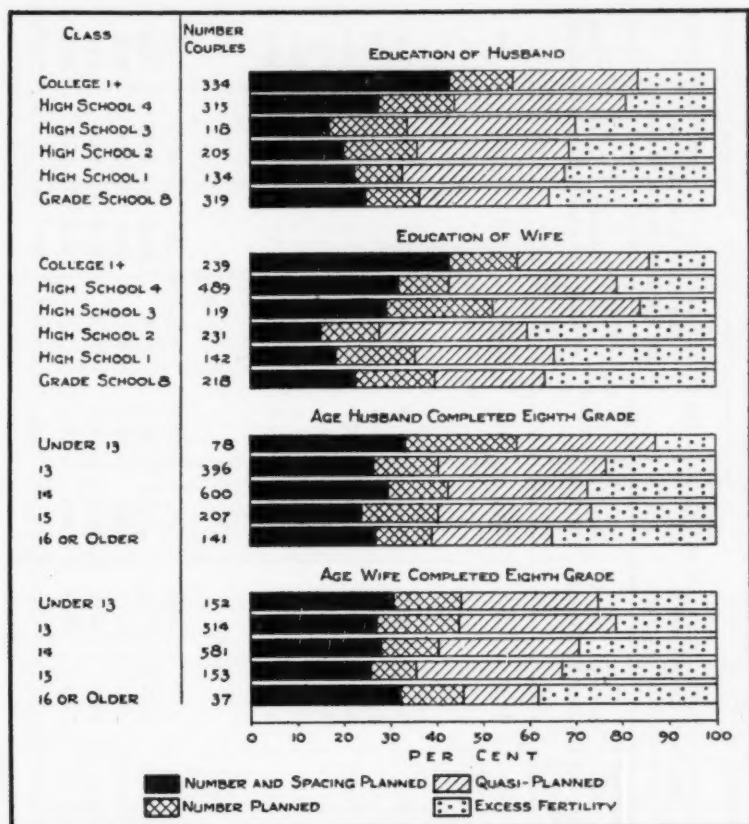


Fig. 6. Percentage distribution by fertility-planning status among "relatively fecund" couples subdivided by educational attainment of the husband and wife and by age of husband and wife at completion of eighth grade (see Tables 6-7).

toward an increasing proportion of "excess fertility" couples with increasing age at completion of eighth grade (see Table 7 and lower sections of Figure 6).

It is also of interest to note that the direct relation of fertility-planning to socio-economic status is as sharply manifested in the classification by Chapin's Scale and in the classification by the more comprehensive index of socio-economic status as in any based upon a single attribute (compare Figure 7 with Figures

Table 8. The relation of fertility-planning status of "relatively fecund" couples to rating on Chapin's social status scale and to summary index of socio-economic status.

MEASURE OF SOCIO-ECONOMIC STATUS	PER CENT DISTRIBUTION BY PLANNING STATUS <sup>1</sup>					PER CENT DISTRIBUTION BY SOCIO-ECONOMIC STATUS <sup>1</sup>				
	Total	Number and Spacing Planned	Number Planned	Quasi- Planned	Excess Fertility	Total	Number and Spacing Planned	Number Planned	Quasi- Planned	Excess Fertility
ALL COUPLES	100	27.9	14.2	31.4	26.5	100	100	100	100	100
Rating on Chapin's Social Status Scale										
175+	100	49.0	17.0	25.7	8.3	14.3	25.1	17.1	11.7	4.5
150-174	100	35.1	17.5	31.8	15.6	14.6	18.4	18.0	14.8	8.6
125-149	100	31.4	16.5	36.5	15.7	17.7	19.9	20.5	20.5	10.5
100-124	100	20.3	11.1	38.1	30.5	21.8	15.9	17.1	26.4	25.1
75-99	100	21.5	11.3	27.9	39.3	17.1	13.2	13.7	15.2	25.4
Under 75	100	14.8	13.3	24.8	47.1	14.5	7.7	13.7	11.5	25.9
Index of Socio-Economic Status										
0-19	100	48.7	14.7	24.6	12.1	15.5	27.0	16.1	12.1	7.1
20-29	100	39.1	18.5	30.9	11.5	16.8	23.6	22.0	16.5	7.3
30-39	100	25.4	13.0	38.1	23.5	22.4	20.3	20.5	27.1	19.9
40-49	100	21.8	11.2	32.5	34.5	27.9	21.8	22.0	28.9	36.4
50+	100	11.6	15.9	27.9	44.6	17.4	7.2	19.5	15.4	29.3

<sup>1</sup> For numerical distributions, see Figures 19-20.



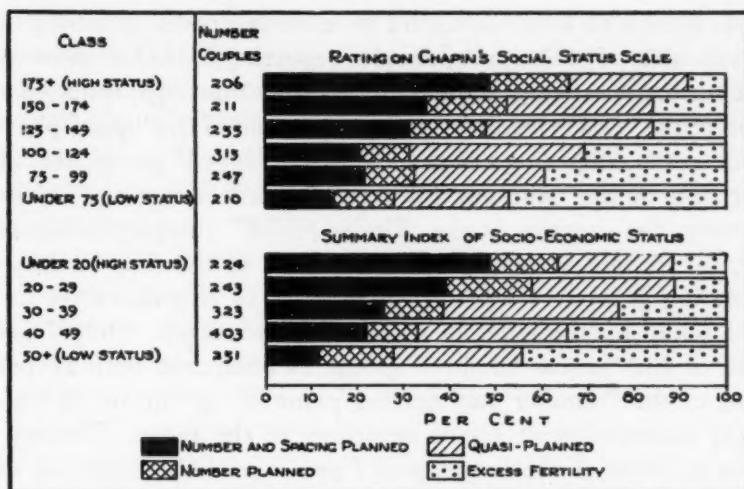


Fig. 7. Percentage distribution by fertility-planning status among "relatively fecund" couples subdivided by Chapin's Social Status Scale and Summary Index of Socio-Economic Status (see Table 8).

5-6). This would appear to augur well for the usefulness of both of these indices.

Finally, if the summary index of socio-economic status alone is used in relation to the hypothesis and if the term "proportion practicing contraception effectively" is considered to be equivalent to the proportion of couples classified as either "number and spacing planned" or "number planned," we find the proportion practicing contraception effectively rises consistently from a low of 27 per cent for the couples of lowest socio-economic position to 63 per cent for those of highest socio-economic position.

*Socio-Economic Composition of the Several Fertility-Planning Groups.* The direct relation of fertility planning to socio-economic status is also pointed up in the data concerning the composition of the separate fertility-planning groups by socio-economic status. These data, shown in the section at the right of Tables 5-8, are the converse of those previously presented.

As expected, the proportionate representation of couples of high socio-economic status increases notably as one proceeds

from groups of least successful to most successful planning of family size. For instance, couples reporting \$3,000 or more as the husband's average annual income since marriage, form 5 per cent of the "excess fertility" group, 6 per cent of the "quasi-planned" group, 10 per cent of the "number planned" group, and 14 per cent of the "number and spacing planned" group. Conversely, the couples in the "Under \$1,200" category compose 30, 18, 15, and 11 per cent, respectively, of the four fertility-planning groups. Clear-cut differentials of this character are also found by the index of socio-economic status. Only 7 per cent of the "excess fertility" group, as compared with 27 per cent of the "number and spacing planned" group are of top-most socio-economic status according to the index. Twenty-nine per cent of the former and 7 per cent of the latter are of lowest socio-economic status.

As indicated earlier, the several fertility-planning groups differ relatively little with respect to age at which husband and/or wife completed eighth grade. The variation that does exist is a little more apparent with respect to husbands than wives and is in the direction of a decrease in age at completion of eighth grade with an advancement in fertility-planning status.

#### FERTILITY RATES BY SOCIO-ECONOMIC AND FERTILITY-PLANNING STATUS

Figures 8-20 present fertility rates by various measures of socio-economic status within groups of given fertility-planning status. The top sections of these charts show fertility rates for the total group of "planned" families ("number and spacing planned" and "number planned" combined) and for all "relatively fecund" couples regardless of planning status. The lower sections show data separately for each of the four fertility-planning-status groups but broader socio-economic classes are used.

Whatever the measure of socio-economic status, in the top-most class the fertility rate for the "planned" families tends to be about as high as that for all couples.<sup>25</sup> The gap between the

<sup>25</sup> This stems partly from the heavy representation of "planned" families within  
(Continued on page 223)

two rates tends to increase with lowering of socio-economic status because the "planned" families fail to exhibit much in the way of an increase in fertility with a lowering of socio-economic status. In other words, the range of class differences in fertility among the couples classified as "planned" is relatively narrow as compared with that for all couples. (Compare first sections of bars with total lengths of bars.)

In general, it appears fairly clear from these data that the "planned" families are chiefly responsible for the exceptions to the inverse relation of fertility to socio-economic status observed among all couples regardless of planning status. Some variation in the character of class differences in fertility of the "planned" families is exhibited by the various measures of socio-economic status, but the predominant pattern is that of (a) above-average manifestation of the direct relation of fertility to socio-economic status in the categories of higher economic status, (b) a wider than average middle band of approximately equal fertility rates, and (c) a relatively faint manifestation of the inverse relation when the two or three categories of lowest socio-economic status are considered. Only to a very limited extent do the data for the total group of "planned" families support the proposition that "the higher the socio-economic status . . . . the smaller the size of the planned family," the last part of the hypothesis with which we are concerned.

A much clearer understanding of the relation of class differences in fertility to fertility planning is afforded by the lower sections of Figures 8-20 where the data are shown separately for the four subdivisions by planning status. These data yield what is believed to be one of the most significant findings of the Indianapolis Study. Briefly stated, they suggest strongly that despite the relatively low fertility levels of the "number and spacing planned" group, the fertility rates within this group tend to be directly, instead of inversely, associated with socio-economic status. Descending the scale by fertility-planning

the topmost socio-economic class and partly from the relatively low fertility rates of other couples in that class.

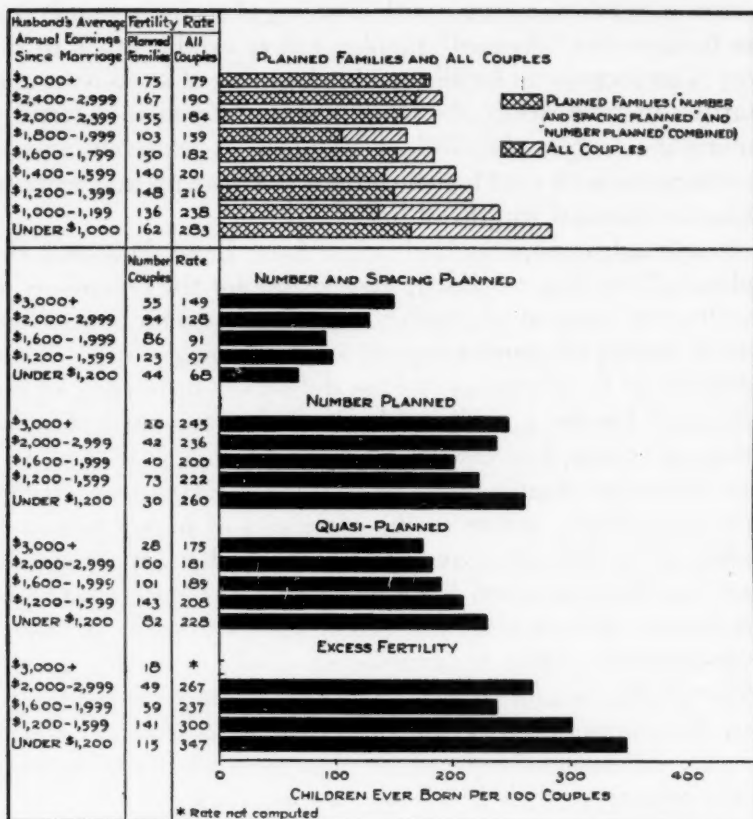


Fig. 8. Number of children ever born per 100 couples, by fertility-planning status and husband's average annual earnings since marriage.

status, one finds a somewhat orderly transition from the direct to the inverse relation of fertility and socio-economic status.

*Husband's Average Annual Earnings Since Marriage.* Conspicuous examples of the foregoing patterns are afforded by the data on husband's earnings since marriage, Figure 8. Within the "number and spacing planned" group the fertility rate for the "\$3,000 and over" couples is highest and that for the "Under \$1,200" couples is lowest, the latter being less than one-half of the former. It should be emphasized, however, that the population bases of these groups are relatively small. Within each

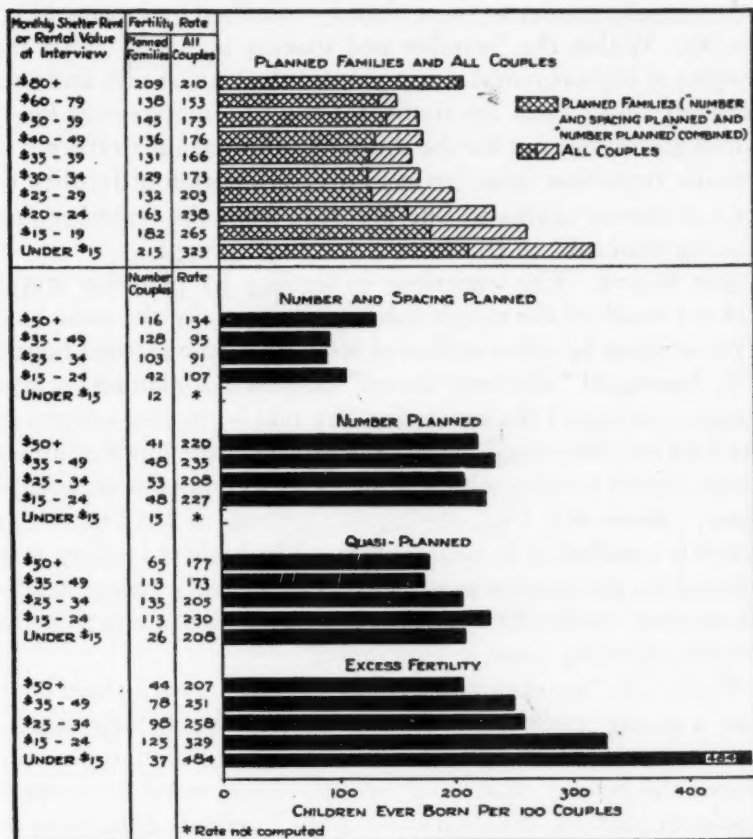


Fig. 9. Number of children ever born per 100 couples, by fertility-planning status and monthly shelter rent or rental value of the home at interview.

planning-status group below the "number and spacing planned," the lowest income group exhibits the highest fertility rate, but it is only among the "quasi-planned" group that the highest income class is characterized by the lowest fertility rate. Although not presented, the results are essentially similar for the first, second, and third periods of married life (of approximately four years each) considered separately.

*Monthly Rental Value of the Home at Interview.* The patterns of differential fertility by rental and planning status are

substantially similar to those already described by income (Figure 9). Within the "number and spacing planned" group the couples of highest rental status exhibit the highest rate and successively lower rates are found for the two successively lower rental groups but not for the third. There is again a rather systematic transition from direct to inverse relation of fertility to socio-economic status as one proceeds from the "number and spacing planned" to the "excess fertility" group.

*Net Worth.* The variations in fertility by planning status and net worth of the couple exhibit substantially the same patterns as those by other indices of socio-economic status (Figure 10). Among all "relatively fecund" couples (all-planning-status groups combined) the lowest fertility rate is that for couples in the \$4,000-5,999 category. Above this level the familiar direct association of fertility with advancing socio-economic status appears. Below this level the inverse relation of fertility to net worth is manifested to some extent. The highest fertility rate is found for the couples reporting a positive net worth of smallest amount (under \$200). The second-highest rate is that for couples reporting a net indebtedness.

Within the "number and spacing planned" group there is at least a strong tendency for fertility rates to be directly associated with net worth. Within the remaining planning-status groups the inverse relation of fertility to net worth is the predominant pattern, although some of the interclass differences in fertility are small. The high fertility rate for the couples of lowest "net worth" and lowest planning status is conspicuous.

*Occupational Class of the Husband.* Fertility rates by planning status and occupational class of the husband are presented in Figure 11. In general, the data by occupation conform fairly well to those previously discussed by income. Those for the "number and spacing planned" group do not exhibit the direct relation between fertility and occupational status in striking form. Within this group, however, the fertility rate is lower for the clerical occupations than for the other "white-collar" occupations, and for the semi-skilled than the skilled.



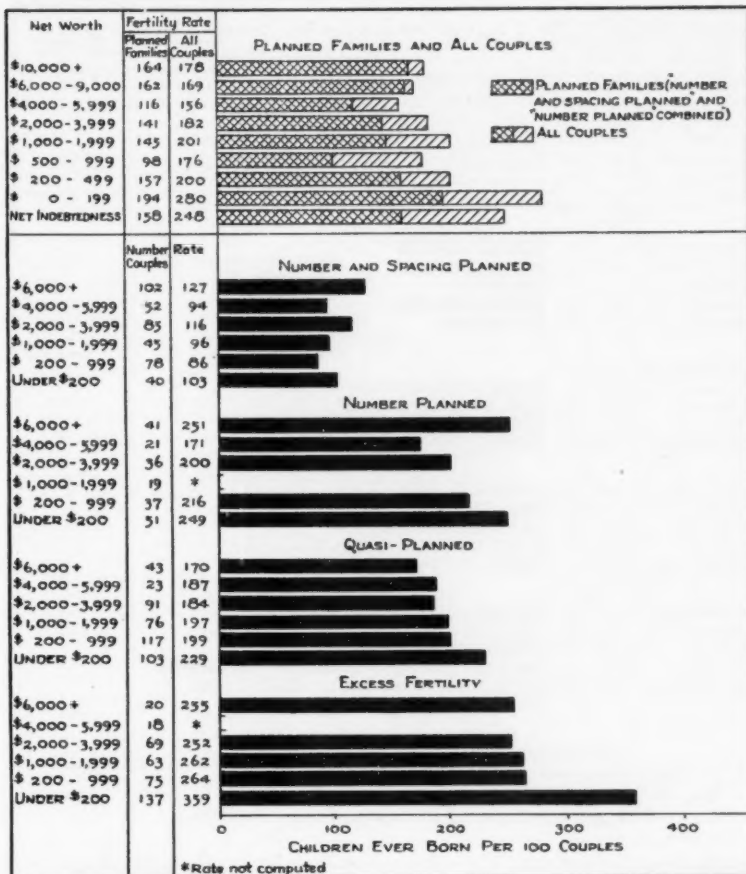


Fig. 10. Number of children ever born per 100 couples, by fertility-planning status and net worth.

*Purchase Price of Present Car.* Data regarding the relation of fertility to ownership and price of car may seem at first thought to be of minor significance. On the other hand, some writers mention the automobile as an important medium for "conspicuous consumption" and "keeping up with the Jones's," and others find it a ready example of a "material thing" that competes with the planning for additional children.

All but 234 (about 16 per cent) of the "relatively fecund"

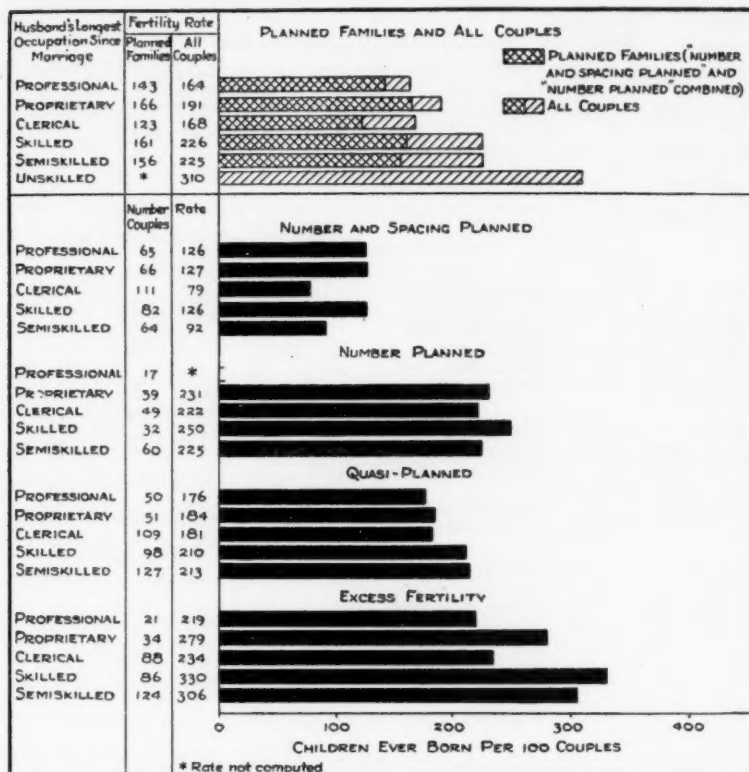


Fig. 11. Number of children ever born per 100 couples, by fertility-planning status and longest occupation of the husband since marriage.

couples owned a car. The observed fertility differentials by purchase price of car and planning status are charted in Figure 12. The data for all couples present patterns of fertility variations much like those based upon other indices of socio-economic status. The lowest fertility rate is that for the couples in the second-highest "purchase price of car" category and the highest rate is that for the group owning lowest-cost jalopies. Couples owning no car at all have the second-highest fertility rate.

The data on fertility by purchase price of car may appear to offer an exception to the previously described tendency for fertility rates to vary directly with socio-economic rank within the

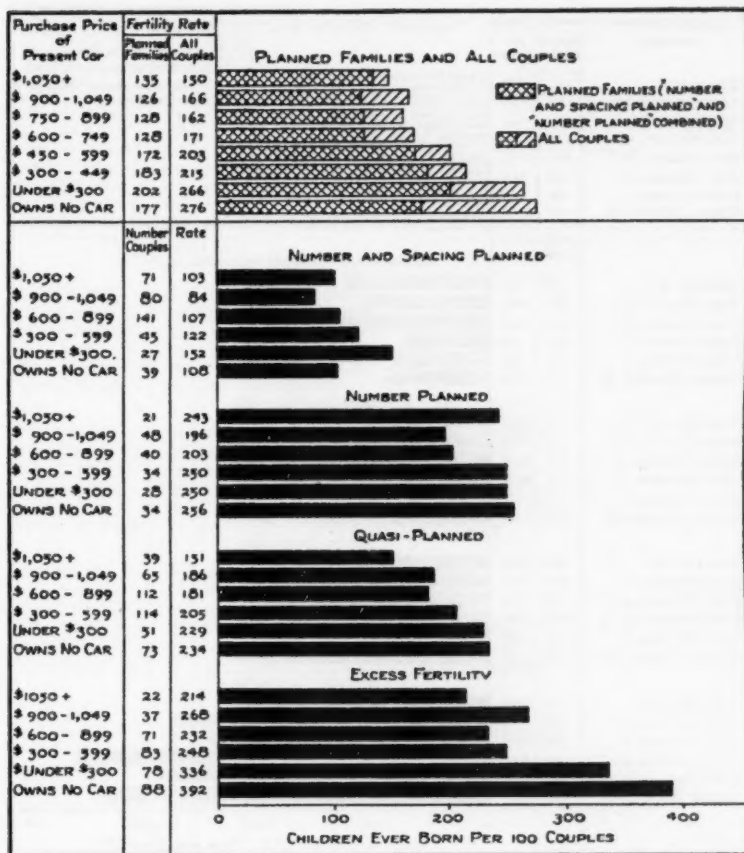


Fig. 12. Number of children ever born per 100 couples, by fertility-planning status and purchase price of present car.

"number and spacing planned" group. In fact, within this most completely planned group there appears to be, despite the mixed character of the relationship, a rather prominent tendency for fertility to vary *inversely* with purchase price of car. The exception may be due to sampling errors or to deficiencies in purchase price of car as an index of socio-economic status. On the other hand, an inverse relation of fertility to purchase price of car within this group might be interpreted in terms of the previously mentioned displaced alternatives. Among those

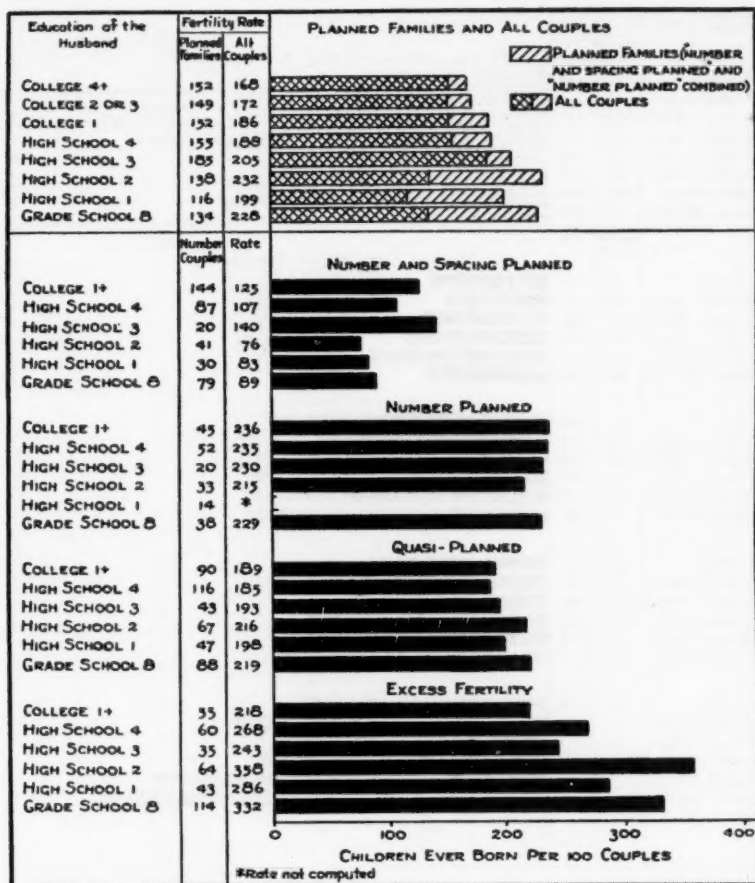


Fig. 13. Number of children ever born per 100 couples, by fertility-planning status and educational attainment of the husband.

having the number and spacing of children under control are doubtless many who cannot afford both a child and an expensive automobile. Some elect one, others another.

*Educational Attainment of the Husband and Wife.* In Figures 13 and 14, fertility rates are shown by educational attainment of the husband and wife separately. In general, the data for specific planning-status groups are consistent with those previously discussed. Among "number and spacing planned"

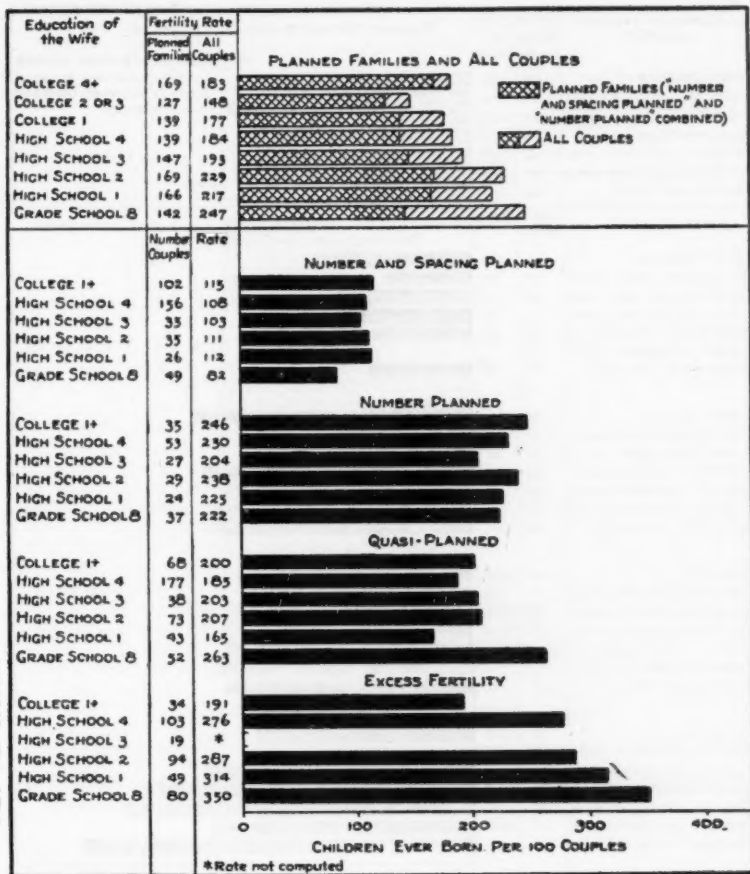


Fig. 14. Number of children ever born per 100 couples, by fertility-planning status and educational attainment of the wife.

couples a direct relation is not so fully manifested between fertility and educational attainment as between fertility and income.

In Figure 15 the data are presented on the basis of joint educational attainment of the husband and wife. If all planning-status groups are combined, the fertility rate is smallest for couples in which the wife but not the husband had one or more years of college training. It is largest for couples of lowest edu-

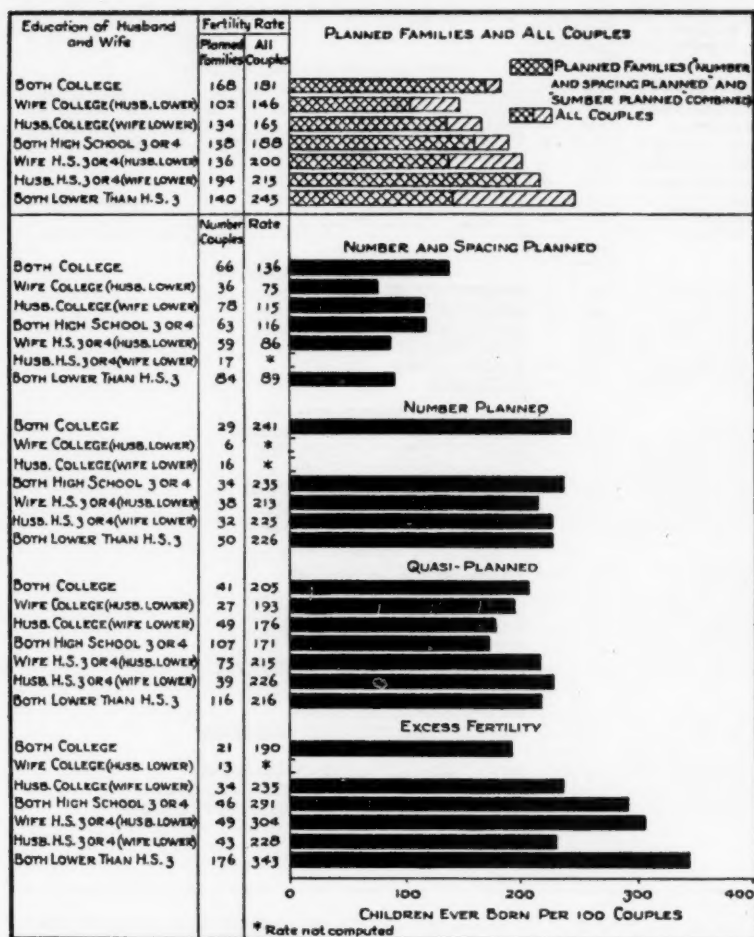


Fig. 15. Number of children ever born per 100 couples, by fertility-planning status and educational attainment of the couple.

cational attainment considered in the joint classification. If attention is limited to the three groups in which the husband and wife are in the same category, we find a fertility rate of 181 live births per 100 couples for the "Both College" group, 188 for the "Both High School 3 or 4" group, and 245 for the "Both Lower Than High School 3" group. The smaller rate for the "Wife College—Husband Lower" than for the "Husband College—



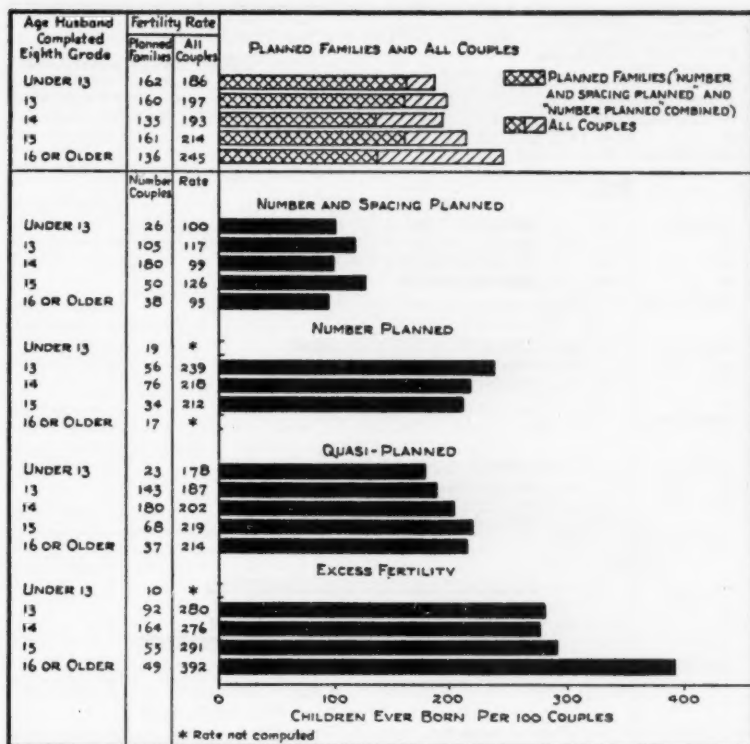


Fig. 16. Number of children ever born per 100 couples, by fertility-planning status and age of husband at completion of eighth grade.

Wife Lower" group, and for the "Wife High School 3 or 4—Husband Lower" than for the "Husband High School 3 or 4—Wife Lower" group attest again to the somewhat closer relation of the wife's than of the husband's educational attainment to the fertility of the couple.

Within the "number and spacing planned" group the largest fertility rate observed is that for the "Both College" group. Also relatively large are the rates for the "Husband College—Wife Lower" and "Both High School 3 or 4." Although the rate for the "Wife College—Husband Lower" group is the smallest, the rates are also comparatively small for the two groups of lowest educational attainment.

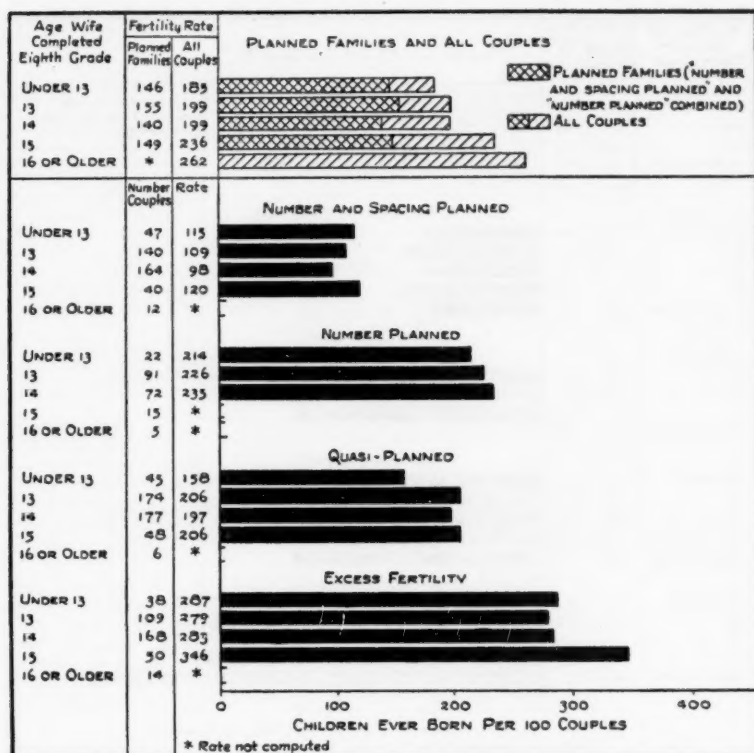


Fig. 17. Number of children ever born per 100 couples, by fertility-planning status and age of wife at completion of eighth grade.

The suggestion of some direct association of fertility to educational attainment within the "number planned" group also appears in the joint classification, but the interclass differences are slight and the groups themselves are of small size. The inverse relation of fertility to educational attainment is again rather conspicuous within the group of lowest planning status.

*Age at Completion of Eighth Grade.* Whatever their significance may be, the fertility rates by planning status and age at completion of eighth grade are of interest. As already noted, fertility rates are to some extent directly associated with age at completion of eighth grade in the data for all planning-status groups combined (Figures 16-18, top sections). Within the

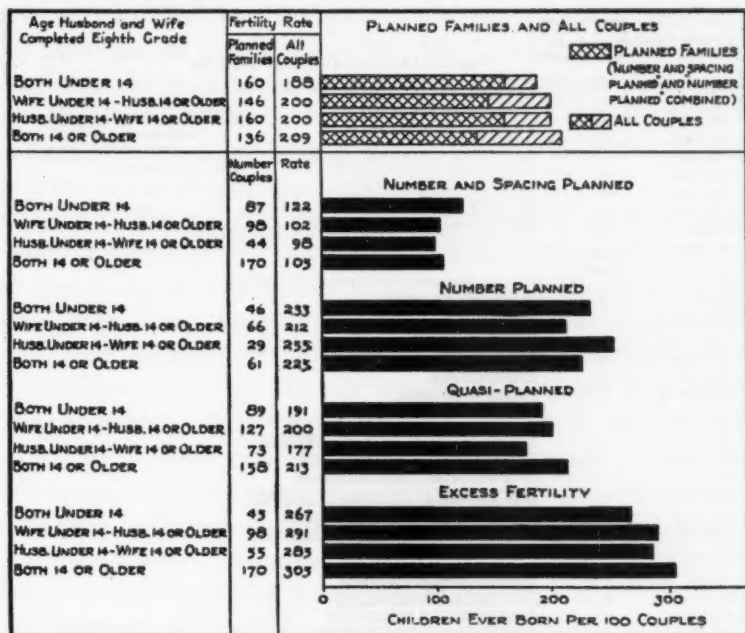


Fig. 18. Number of children ever born per 100 couples, by fertility-planning status and age of husband and wife at completion of eighth grade.

"number and spacing planned" groups there is little relation between fertility and age of either the husband or wife at completion of eighth grade. In the joint classification (Figure 18), however, the highest fertility rate is found for the "Both Under 14" group. The inverse relation appears within the group of lowest planning status and is fairly consistent in the joint classification.

*Chapin's Social Status Scale.* As previously observed, in the total group (regardless of planning status) the inverse relation of fertility to rank on Chapin's Social Status Scale is the predominant pattern (Figure 19), but the familiar exception is exhibited by couples of highest rank (200 and over). Among the "number and spacing planned" families the group of highest social status is also the group of highest fertility but there is otherwise little in the way of a direct relation of fertility to "so-

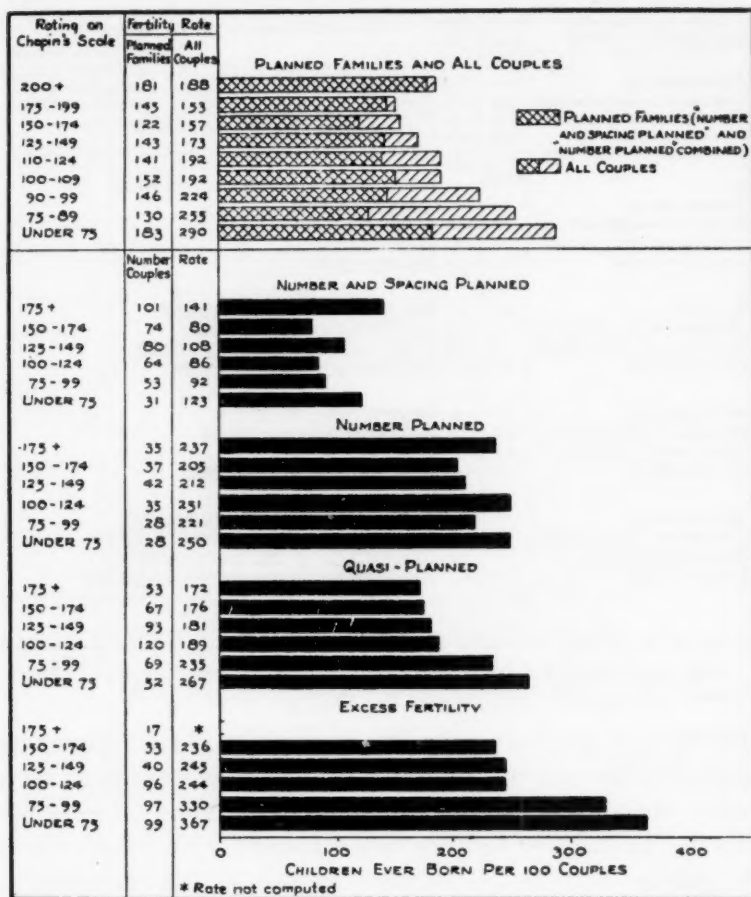


Fig. 19. Number of children ever born per 100 couples, by fertility-planning status and rating on Chapin's Social Status Scale.

cial status." Within the "number planned" group there appears to be little systematic association of fertility to "social status." Within the two remaining planning-status groups the inverse relation of fertility to social status is fairly consistent but the interclass differences in fertility are relatively small for couples having scores of 100 and over.

Attention should be called again to the possibility that selective factors help account for the conspicuously high fertility

rates of couples of low "social status" score. Families with several children are less likely to buy the furnishings, books, and especially the several periodicals and newspapers that would give them a high score. In addition, there is the difficulty of keeping a living room orderly and immaculate if several children are in the family.

*Index of Socio-Economic Status.* Since the index of socio-economic status is the consolidated rating of couples in eight of the classifications considered above, the class differences in fertility by planning status and "summary score" are of special interest. As already noted, among all couples the class differences in fertility by this variable are essentially the same as those by other variables. Also the data for all "planned" families substantially support previous generalizations made about class differences in fertility of this group (Fig. 20, top section).

Within the "number and spacing planned" group the couples of topmost socio-economic status exhibit the highest fertility rate but the remaining couples within this group differ little with respect to fertility. The inverse relation of fertility to socio-economic status is clear-cut in the "quasi planned" and "excess fertility" groups and a conspicuously high fertility rate is seen for couples of lowest socio-economic and planning status.

*Interpretation.* In summary, despite exceptions of the type mentioned above, which in some cases might clearly be the results of inadequate samples, the data in Figures 8-20 collectively exhibit a distinct tendency toward (a) a direct relation of fertility to socio-economic status within the "number and spacing planned" group, and (b) a progressive transition to the inverse relation of fertility to socio-economic status in the "excess fertility" group.

Adequate interpretation of the direct relation within the "number and spacing planned" group must await the analysis of data relating to other hypotheses. It should be pointed out, however, that the "number and spacing planned" group is more homogeneous than any other considered here with respect to regularity of contraceptive practice. This group practiced con-

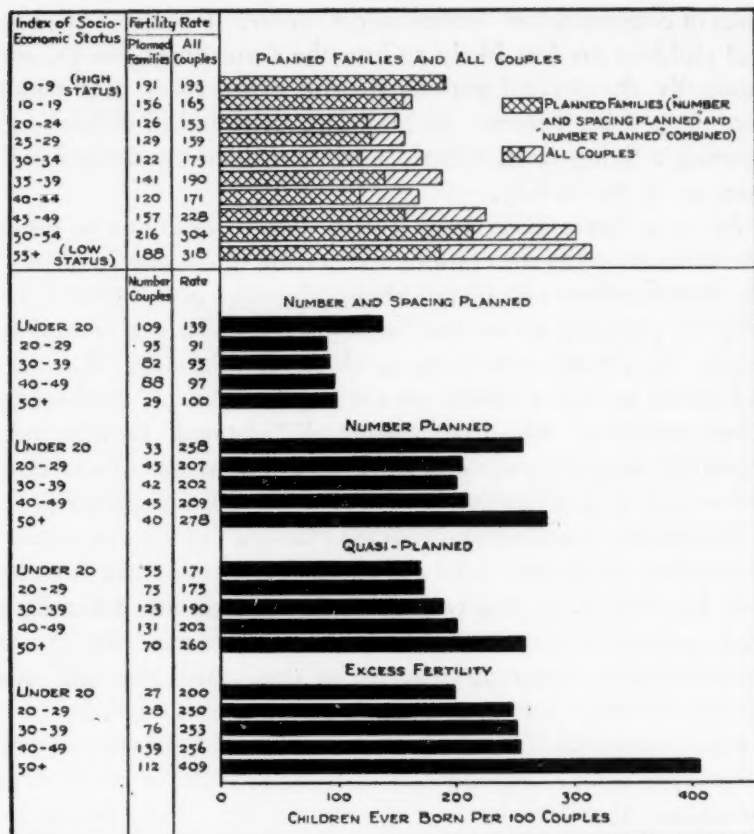


Fig. 20. Number of children ever born per 100 couples, by fertility-planning status and by rating on the Summary Index of Socio-Economic Status.

traception effectively stopping only for planned pregnancies. In consequence, the factors of differential prevalence and effectiveness of contraceptive practice—the factors underlying the general inverse relation of fertility to socio-economic status—are removed. It seems likely that the removal of these factors serves to unmask the influence of other factors—such as feelings of economic security—which may be directly associated both with socio-economic status and desire for children. This is stated here only as an hypothesis which will be considered further in a later analysis.



The couples in the "excess fertility" group are by no means homogeneous with respect to contraceptive practice. If none of them had ever practiced contraception at all one would expect, on the basis of previous studies, to find uniformly high fertility rates regardless of socio-economic status. Actually, virtually all of the couples in this group reported at least some effort at contraceptive practice. But this range extended from far "too little and too late" to the successful prevention of pregnancy after only one unwanted by either the husband or wife. It is altogether probable that the degree of contraceptive practice was directly associated with socio-economic status.

Since all of the "excess fertility" couples had one or more pregnancies after the last one wanted, a few experimental tabulations were made to ascertain whether the inverse relation of fertility to socio-economic status would persist if the live births resulting from pregnancies after the last one wanted by the husband or wife were excluded from consideration. As indicated in Figure 21, the inverse relation persists although the range of variation in fertility by socio-economic status is considerably diminished. The persistence of some inverse relation of wanted pregnancies to socio-economic status possibly reflects some rationalization on the part of the couples or a tendency to change attitudes toward given pregnancies after the event or after the birth of the child.

If differential contraceptive practice is the chief factor underlying the inverse relation of fertility to socio-economic status in the "excess fertility" group and the differential impact of factors other than contraceptive practice underlies the direct relation of fertility to socio-economic status among the "number and spacing planned" group, it would seem plausible that some mixture of the two sets of factors underlies the frequently found mixed relation of fertility to socio-economic status within the "number planned" and "quasi-planned" groups. Thus, as indeed would appear to be the case from data on socio-economic status and fertility regardless of planning status, the fact of differential contraceptive practice accounts for the inverse re-

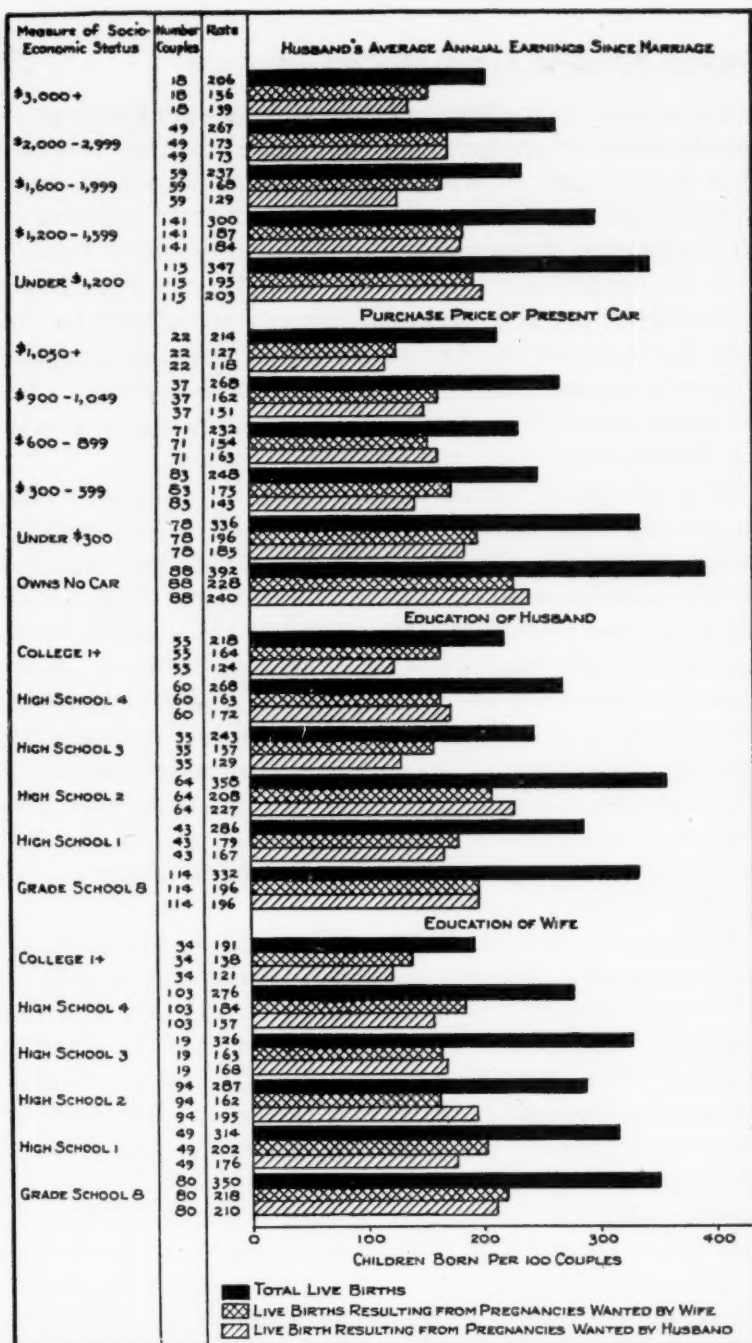


Fig. 21. Total number of children ever born per 100 "excess fertility" couples and number resulting from pregnancies wanted by the husband and wife, by husband's average annual earnings since marriage, purchase price of present car, and educational attainment of the husband and wife.

lation up to a given socio-economic level. Above this level the practice of contraception may be sufficiently universal to reveal the operation of factors that are positively associated with both fertility and socio-economic status.

#### SUMMARY

The 41,498 native-white once-married couples with wife under 45 in the Indianapolis Household Survey exhibit fertility rates by age and age at marriage quite similar to those for comparable couples in all cities of 250,000 population and over in this country.

Owing to the eligibility restrictions, and perhaps mainly to the restriction to Protestant couples with at least a complete elementary school education, the 1,977 couples in the inflated sample (used in the more intensive Indianapolis Study) are on the average about 15 per cent less fertile than the couples in cities of 250,000 and over.

The available classifications of the 1,977 couples in the inflated sample by fecundity status, fertility-planning status, and socio-economic status are used in this article for analyses of (1) the relation of fecundity status to socio-economic status, (2) fertility rates by socio-economic and fecundity status, (3) the relation of fertility planning to socio-economic rank, and (4) fertility rates by socio-economic and fertility-planning status. The two latter relationships are directly pertinent to the hypothesis stated at the beginning of this paper.

Little relation of fecundity status to socio-economic class is found. Of the 1,977 couples, about 73 per cent (1,444) are classified as "relatively fecund" and about 27 per cent (533) as "relatively sterile" on the basis of criteria described in the text. These average proportions tend to remain much the same in the subdivisions by various measures of socio-economic status. About 10 per cent (201) of the couples were classified not only as "relatively sterile" but also as "never pregnant." Although somewhat more variable, this proportion does not differ systematically by socio-economic status.

Not only the *proportions* of couples classified as "relatively sterile" but also the *fertility rates* of the "relatively sterile" couples fail to exhibit systematic variations by socio-economic status. The "relatively fecund" couples are almost entirely responsible for the systematic variations in fertility observed for couples in the total inflated sample. Therefore, the restriction of many analyses in the Indianapolis Study to "relatively fecund" couples affords some compensation for the depressing influence of eligibility requirements on both the magnitude and the internal variations of fertility rates by socio-economic status.

Among the "relatively fecund" couples the sharp class differences in fertility arise in large measure from class differences in success in planning family size. For instance, the proportion of "planned" families ("number and spacing planned" or "number planned") is 59 per cent among couples reporting husband's average annual earnings as \$3,000 or more, and 34 per cent for those reporting under \$1,200. The proportions of "excess fertility" couples are 11 and 46 per cent, respectively, for these two income classes. Relationships of this general order are also found in classifications by rental status, net worth, occupation, purchase price of car, education (of husband and wife), Chapin's Scale, and the summary "index of socio-economic status" based upon average ratings of couples on all the eight items mentioned above.

The data regarding fertility rates by socio-economic and fertility-planning status afford one of the most significant findings to date from the Indianapolis Study. Despite the relatively low fertility of the "number and spacing planned" group, the fertility rates within this group tend to increase rather than to decrease with rising socio-economic status. Descending the scale by planning status, one finds from these data a rather systematic transition from a direct association of fertility to socio-economic status in the "number and spacing planned" group, to an inverse relation of these variables within the "excess fertility" group. Some of the factors underlying these relation-

ships are fairly evident, but an adequate interpretation must await further analysis of the data.

Finally, with reference to the hypothesis considered in this article, "The higher the socio-economic status, the higher the proportion of couples practicing contraception effectively, and the smaller the planned family," the first part is definitely confirmed by the Indianapolis data but the second part is not. The hypothesis has reference to the "number and spacing planned" and "number planned" groups combined. However, these two groups exhibit marked contrasts in class differences in fertility, and therefore a combination of the two tends to conceal the actual relationships. The second part of the hypothesis is partially confirmed by the experience of the "number planned" but not by the "number and spacing planned" group.

## APPENDIX I

## Chapin's Social Status Scale

## Part I. Material Equipment and Cultural Expression of the Living Room of the Home

- |  |       |  |       |
|--|-------|--|-------|
| a. Floor, softwood (6) .....                   | _____ | i. Desk: personal social (8) .....     | _____ |
| hardwood (10) .....                            | _____ | j. Bookcases with books (8 each) ..... | _____ |
| b. Large rug (8) .....                         | _____ | k. Sewing machine (-2) .....           | _____ |
| c. Windows with drapes (ea. window 2) .....    | _____ | l. Couch pillows (2 each) .....        | _____ |
| d. Fireplace with 3 or more utensils (8) ..... | _____ | m. Alarm clock (-2) .....              | _____ |
| e. Artificial light, electric (8) .....        | _____ | n. Periodicals (8 each) .....          | _____ |
| kerosene (-2) .....                            | _____ | o. Newspapers (8 each) .....           | _____ |
| f. Library table (8) .....                     | _____ | p. Telephone (8) .....                 | _____ |
| g. Armchairs (8 each) .....                    | _____ | q. Radio (8) .....                     | _____ |
| h. Piano bench (4) .....                       | _____ | r. Score on Part I .....               | _____ |

## Part II. Condition of Articles in Living Room

- |  |       |   |       |
|--|-------|---|-------|
| a. Cleanliness of room and furnishings                             |       | t. Orderliness of room and furnishings                                  |       |
| 1. Spotted or stained and dusty (-6) .....                         | _____ | 1. Articles strewn about in disorder (-2) .....                         | _____ |
| 2. Spotted or stained (-4) .....                                   | _____ | 2. Articles in place or in usable order (+2) .....                      | _____ |
| 3. Dusty (-2) .....  | _____ | v. Record your general impression of good taste                         |       |
| 4. Spotless and dustless (+2) .....                                | _____ | 1. Bizarre, clashing, inharmonious or offensive (-4) .....              | _____ |
| u. Condition of repair of articles and furnishings                 |       | 2. Drab, monotonous, neutral, inoffensive (-2) .....                    | _____ |
| 1. Broken, scratched, frayed, ripped, or torn (-4) .....           | _____ | 3. Attractive in positive way, harmonious, quiet and restful (+2) ..... | _____ |
| 2. Articles or furnishings patched up (-2) .....                   | _____ | w. Score on Part II .....   | _____ |
| 3. Articles or furnishings in good repair and well kept (+2) ..... | _____ | x. Total score, Parts I & II (r + w) .....                              | _____ |

On payment of a modest royalty, permission was secured to incorporate Chapin's Scale in schedules used in the Indianapolis Study. The present reproduction is from Form S of those schedules.



## APPENDIX II.

Scores in each of eight classifications used for computing the average rating of each couple in the Summary Index of Socio-Economic Status.<sup>1</sup>

Score	Average Annual Earnings of Husband since Marriage	Shelter Rent at Interview	Net Worth	Husband's Longest Occupation <sup>2</sup>	Purchase Price of Car <sup>3</sup>	Education of Husband	Education of Wife	Chapin's Scale
0	\$4,000 +	\$80 +	\$10,000 +	Professional	....	College 4 +	College 4 +	200 +
1	\$3,000-3,999	\$60-79	\$ 6,000-9,999	Proprietors Managers Officials	\$1,200 +	College 3	College 3	175-199
2	\$2,400-2,999	\$50-59	\$ 4,000-5,999	Clerical	\$1,050-1,199	College 2	College 2	150-174
3	\$2,000-2,399	\$40-49	\$ 2,000-3,999	Skilled	\$ 900-1,049	College 1	College 1	125-149
4	\$1,800-1,999	\$35-39	\$ 1,000-1,999	Semi-skilled	\$ 750- 899	High School 4	High School 4	110-124
5	\$1,600-1,799	\$30-34	\$ 500- 999	Personal and Protective Service	\$ 600- 749	High School 3	High School 3	100-109
6	\$1,400-1,599	\$25-29	\$ 200- 499	....	\$ 450- 599	High School 2	High School 2	90- 99
7	\$1,200-1,399	\$20-24	\$ 0- 199	Other Service Workers	\$ 300- 449	High School 1	High School 1	75- 89
8	\$1,000-1,199	\$15-19	Net Debt Under \$200	....	\$ 150- 299	Grade School 8	Grade School 8	60- 74
9	Under \$1,000	Under \$15	Net Debt \$200+	Unskilled (Except Farm)	Under \$150	Under Grade School 8	Under Grade School 8	Under 60

<sup>1</sup> In order to have all couples scored on all eight items, the few cases of "unknowns" were scored on the basis of the couple's average known scores.

<sup>2</sup> An occupational score of "3" was assigned to three husbands coded as "farm owner or farm manager" and a score of "8" was assigned to two coded as "farm laborer or farm foreman."

<sup>3</sup> The score assigned those owning no car was the average of the scores on the other measures of socio-economic status.







## BOOKS

### In Collaboration with the Milbank Memorial Fund

**BACKGROUND OF SOCIAL MEDICINE.** 1945. A panel Conference of the Milbank Memorial Fund, 1945. 742 pages. \$1.00.

**CONTRACEPTION AND FERTILITY IN THE SOUTHERN APPALACHIANS.** By Gilbert Wheeler Smith, Ph.D., Philadelphia, J. P. Lippincott, The Williams and Wilkins Company, 1945, 240 pages. \$1.00.

**DEMOGRAPHIC STUDIES OF SELECTED AREAS OF RAPID GROWTH.** Proceedings of the Round Table on Population Problems, the Twenty-second Annual Conference of the Milbank Memorial Fund, April 22-24, 1945. New York, Milbank Memorial Fund, 1945. 148 pages. paper binding. \$1.00.

**DISTRICT HEALTH ADMINISTRATION: A Study of Organization and Planning.** By Dr. V. Milbank, Lancaster, Pennsylvania, The Science Press, Printing Company, 1946. 120 pages. \$1.00.

**THE FORTIFICATION OF FOODS WITH VITAMINS AND MINERALS.** Symposium held at the American Institute of Nutrition, Toronto, Ontario, April 24, 1949. Milbank Memorial Fund, 1949. 48 pages. \$0.25.

**HEALTH ON THE FARM AND IN THE VILLAGE.** A Review and Synthesis of the Cattaraugus County Health Demonstration with Special Reference to the Lessons for Other Rural Areas. By C. E. A. Winslow, Dr. P.H. New York, The Macmillan Company, 1944. 160 pages. \$1.00.

**INTERNATIONAL RESEARCHES IN NEBULAR OR UNDEVELOPED AREAS.** 1945 Annual Conference of the Milbank Memorial Fund, 1945. 72 pages. \$1.25.

**SEXED POPULATION RESEARCH.** By P. E. Waggoner, Lancaster, Pennsylvania, The Science Press Printing Company, 1936. 240 pages. \$1.00.

**NEW APPROACH TO NUTRITION SERVICES IN STATE HEALTH DEPARTMENTS.** A Proceedings of the Round Table on Nutrition, 1945 Annual Conference of the Milbank Memorial Fund, New York, Milbank Memorial Fund, 1945. 112 pages. \$0.75.

**NUTRITION: THE NEWER DIAGNOSTIC METHODS.** Proceedings of the Section on Nutrition and Public Health at the Fund's sixteenth Annual Conference, Milbank Memorial Fund, 1936. 200 pages. \$1.00.

**POSTWAR PROBLEMS OF MIGRATION.** Proceedings of the Round Table on Population Problems, 1945 Annual Conference of the Milbank Memorial Fund, New York, Milbank Memorial Fund, 1945. 176 pages. \$1.00.

**SEXUAL AND PSYCHOLOGICAL FACTORS AFFECTING FERTILITY.** Volume I, New York, Milbank Memorial Fund, 1945, 146 pages. \$1.00.

Orders for these books, sent to the Milbank Memorial Fund, 40 Wall Street, New York 5, will be forwarded to the publisher.

